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PERSONALITY DISORDERS IN DEPRESSED ADOLESCENT OUTPATIENTS

IMPACT ON OUTCOME AND TREATMENT OF DEPRESSION, CHANGES IN SYMPTOMS, AND PREDICTORS INTO YOUNG ADULTHOOD

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ACADEMIC DISSERTATION

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TIIVISTELMÄ

Persoonallisuushäiriöt ovat yleisiä nuoruusikäisillä, mutta niiden vaikutus masennuksen kulkuun ja kehitykseen nuoruudesta aikuisuuteen on edelleen vähän tutkittu alue. Tämän tutkimuksen tavoite oli tutkia masennuksen ja persoonallisuushäiriöiden yhteyksiä vuoden seurannassa nuoruusiässä ja kahdeksan vuoden seurannassa nuoruudesta aikuisuuteen, persoonallisuushäiriöoireiden muutosta nuoruusiässä, persoonallisuushäiriöiden yhteyttä defenssimekanismeihin, sosiaaliseen tukeen ja samanaikaisiin psykiatrisiin häiriöihin masentuneilla nuorilla.

Tämä tutkimus on osa Nuorten Depressio-tutkimusta (ADS). Seurantatutkimuksen aineisto koostui 218 masennusdiagnoosin saaneesta nuorisopsykiatriseen avohoitoon hakeutuneesta 13-19- vuotiaasta nuoresta. Tutkimuksen alkumittauksessa, 6 kk ja yhden vuoden mittauksissa nuoria haastateltiin puolistrukturoiduilla diagnostisilla haastattelumenetelmillä (K-SADS-PL; SCID-II). Näiden lisäksi käytettiin standardoituja kyselylomakkeita ja arviointiasteikkoja. Kahdeksan vuoden seurantamittauksessa käytettiin puolistrukturoituja diagnostisia haastatteluja (SCID-I ja SCID-II) sekä samoja standardoituja kyselylomakkeita ja arviointiasteikkoja kuin aiemmilla mittauskerroilla.

Tutkimukseen osallistuneista 67 %:lla depressio uusiutui kahdeksan vuoden seuranta-aikana ja yli puolella oli mielialahäiriö vähintään 25% seuranta-ajasta. Kahdeksan vuoden seurantamittauksessa 36%:lla oli mielialahäiriö, 48%:lla ahdistuneisuushäiriö ja 26%:lla oli persoonallisuushäiriö. Vuoden seurannassa hoidon ennuste oli heikompi niillä nuorilla, joilla oli samanaikainen persoonallisuushäiriö, eikä hoidon laajuus vaikuttanut hoidon tulokseen positiivisesti. Ne nuoret, joilla ei ollut persoonallisuushäiriötä, hyötyivät laajemmasta hoidosta. Masennuksen vakavuuden ja komorbiditeettitason väheneminen korreloivat positiivisesti persoonallisuushäiriöoireiden vähenemisen kanssa. Korkeampi koettu sosiaalinen tuki assosioitui narsististen, skitsotypaalisten ja paranoidisten persoonallisuushäiriöoireiden vähenemisen kanssa vuoden seurannassa. Nuoruuden epäkypsät defenssimekanismit ennustivat persoonallisuushäiriödiagnoosia aikuisuudessa, kun taas kypsät defenssit eivät assosioituneet suojaavina tekijöinä myöhempään persoonallisuushäiriödiagnoosiin. Erilliset defenssit kohteensiirto, eristäminen (isolaatio) ja reaktionmuodostus olivat vahvimmat nuoren aikuisuuden persoonallisuushäiriödiagnoosia ennustavat yksittäiset defenssit nuoruudessa.

Tutkimustulokset osoittavat nuoruusiän masennuksen vakavuuden ja pitkäaikaisen vaikutuksen ennusteeseen. Jos nuorella oli samanaikainen persoonallisuushäiriö, oli ennuste usein heikompi sekä lyhyessä että pitkässä seurannassa. Sosiaalinen tuki ja tätä kautta kyky liittyä toisiin ihmisiin saattaa vaikuttaa kliinisiin oireisiin, korkeampi koettu sosiaalinen tuki on mahdollinen persoonallisuushäiri-

öoireilta suojaava tekijä. Persoonallisuushäiriöoireilla ja muilla kliinisillä oireilla oli yhteisvaikutuksia, osoittaen kokonaisoirekuvan huomioimisen tärkeyden hoitoa suunniteltaessa. Nuorta, jolla on todettu persoonallisuushäiriö, tulisi hoitaa kyseiseen häiriöön ja oirekuvaan fokusoiduilla hoidoilla. Tulokset tukevat aiempia tutkimustuloksia, joissa todettu defenssien huomioimisen tärkeys hoidon suunnittelussa ja hoidon aikana. Myös erilliset defenssit tulisi huomioida, erityisesti mentaalisen inhibition defenssit.

ABSTRACT

Background. Personality disorders (PDs) among depressed adolescents are common, but there is little research on how PDs impact the course of depression and the long-term development from adolescence into adulthood. The objective of this study was to examine the association between depression and PDs in a one-year follow-up of adolescents and in an eight-year follow-up from adolescence to adulthood, PD symptom change during adolescence, and the associations of PDs with defense mechanisms, social support, and comorbid psychiatric disorders among depressed adolescents.

Methods. This study was part of the Adolescent Depression Study (ADS), a prospective, naturalistic research project. The sample comprised originally depressed adolescent outpatients (N=218) aged 13–19 years, who were interviewed and diagnosed at baseline and at six-month and one-year follow-ups using K-SADS-PL for DSM-IV psychiatric clinical disorders and SCID-II for PD diagnoses. The subjects were further assessed in an eight-year follow-up using diagnostic interviews (SCID-I and -II) and self-report scales, and observer-report rating scales were used at every assessment point.

Results. Of the participants, 67% presented at least one depression recurrence. At the eight-year follow-up, 36% had a mood disorder, and anxiety (48%) and PDs (26%) were also frequent. Over half of all the patients suffered from a mood disorder 25% or more of the follow-up time from adolescence into adulthood. If presenting with comorbid depression and PD, the short-term outcome in psychiatric treatment was worse. Treatment breadth did not impact positively on the outcome for depressed adolescents with a PD, but those without a PD gained from a larger variety of treatments. Decrease in both depression severity and comorbidity rate correlated positively with PD symptom decrease. Higher perceived social support was associated with a decrease in PD symptoms in the PD categories narcissistic, schizotypal, and paranoid. Immature defense mechanisms predicted PDs in adulthood, while mature defense style did not associate negatively with a later PD diagnosis. Displacement, isolation, and reaction formation were the strongest predictors of a PD in adulthood, all considered mental inhibitions.

Conclusion. These results show the seriousness of depression in adolescence and its long-term impact on outcome. In patients presenting with a comorbid PD, the short- and long-term outcomes of depression were generally worse. Social support and thus the ability to connect with other people might impact clinical symptoms,

higher perceived social support being a possible protective factor for symptoms. There was covariation between symptoms of PDs and other psychiatric symptoms, all clinically relevant in treatment planning. Adolescents with PD should be treated with specialized treatments for PDs. In line with earlier studies, the results suggest defense styles should be a focus in treatment planning and content. Also, attention should be directed to separate defenses, especially those having to do with mental inhibition.

ABBREVIATIONS

AACAP	American Academy of Child and Adolescent Psychiatry
ADS	Adolescent Depression Study
AMPD	Alternative Model of Personality Disorders
ANOVA	Analysis of Variance
APA	American Psychiatric Association
BDI	Beck Depression Inventory
BPD	Borderline Personality Disorder
CAT	Cognitive Analytical Therapy
CBT	Cognitive Behavioral Therapy
CI	Confidence Interval
DBT	Dialectical Behavioral Therapy
DBT-A	Dialectical Behavioral Therapy for Adolescents
DSM	Diagnostic and Statistical Manual of Mental Disorders
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, 4th edition
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5th edition
GAF	Global Assessment of Functioning Scale
HDRS	Hamilton Depression Rating Scale
HUCH	Helsinki University Central Hospital
ICD-10	International Classification of Disease, 10th edition
IPT	Interpersonal Psychotherapy
IPT-A	Interpersonal Psychotherapy for Adolescents
K-SADS-PL	Schedule for Affective Disorders and Schizophrenia for School-Aged Children - Present and Lifetime
MDD	Major Depressive Disorder
MDE	Major Depression Episode
OR	Odds Ratio
PD	Personality Disorder
PMCD	Peijas Medical Care District
PSSS-R	Perceived Social Support Scale-Revised
RCT	Randomized Controlled Trial
SCID-II	Structured Clinical Interview for DSM-III-R (DSM-IV) Axis II Personality Disorders
SD	Standard Deviation
SES	Socioeconomic Status
SPSS	Statistical Package for Social Sciences for Windows
SSRI	Serotonine-Selective Reuptake Inhibitor
WHO	World Health Organization

LIST OF ORIGINAL PUBLICATIONS

This thesis is based on the following original articles, referred to in the text by their Roman numerals:

I Kiviruusu O, **Strandholm T**, Karlsson L, Marttunen M. Outcome of depressive mood disorder among adolescent outpatients in an eight-year follow-up. J Affect Disord. 2020 Jan 29;266:520-527. [Epub ahead of print]

II **Strandholm T.**, Karlsson L., Kiviruusu O., Pelkonen M., Marttunen M. Treatment Characteristics and Outcome of Depression Among Depressed Adolescent Outpatients With and Without Comorbid Axis II Disorders. J Pers Disord. 2014;28(6):853-63.

III **Strandholm T.**, Kiviruusu O., Karlsson L., Pankakoski M., Pelkonen M., Marttunen M. Stability and Change in Personality Disorder Symptoms in one-year Follow-up of Depressed Adolescent Outpatients. J Nerv Ment Dis. 2017 ;205(1):15-22.

IV **Strandholm T.**, Kiviruusu O., Karlsson L., Miettunen J., Marttunen M. Defense Mechanisms in Adolescence as Predictors of Adult Personality Disorders. J Nerv Ment Dis. 2016;204(5):349-54.

1 INTRODUCTION

The time from adolescence to adulthood is characterized by rapid and extensive physiological, biological, and psychological changes, readjustment in social relations, especially peer and family relations, cognitive maturation, identity development, and adjustment to adult roles. The incidence and prevalence of psychiatric disorders increase strongly during adolescence, with many adult psychiatric disorders having their onset in adolescence. Approximately 20–25% of the adolescent population has a diagnosable psychiatric disorder (one-year prevalence), depressive and anxiety disorders being among the most common. Also, development of deviant personality traits and personality disorders (PDs) starts early and is associated with adverse life events, problems in parental care, and other psychiatric disorders. Among adults, PDs impact the course of depression, but little is known about how PDs affect the course of depression and comorbid disorders during adolescence and from adolescence into adulthood, highlighting the importance of longitudinal studies.

This study was part of the Adolescent Depression Study (ADS), a prospective, naturalistic research project with originally 218 psychiatric outpatients aged 13–19 years treated for depression. The present follow-up study examined the course of depression, the impact of PDs on depression, changes in PD symptoms during adolescence, and the associations of PDs with psychological defense mechanisms, social support, and comorbid psychiatric disorders among depressed adolescents. The study adds to the extant literature, as scant reports have focused on mechanisms influencing the development of depression and PDs in adolescence and into young adulthood. Nevertheless, adolescence is the time when most psychiatric and psychological problems emerge.

2 REVIEW OF THE LITERATURE

2.1 Adolescent development

Adolescence is a phase of development between the ages of about 12 to 22 years, beginning with biological changes related to puberty starting around the age of 11 (range 8–13) years for females and 13 (range 10–14) years for males. There is no unified theory of adolescent development because of its complexity. Important contents are the development of identity, attachment, and personality from adolescence into adulthood. Some common features can be found in the literature describing adolescence.

Three biopsychological phases have been distinguished in adolescence: early, middle, and late adolescence (Kausch, 1997). Physical, hormonal, and sexual maturation initiates psychological development in early adolescence, beginning at the age of 10–12 years. This phase is characterized by puberty-driven increases in reward seeking and social sensitivity. Peer relations become increasingly important and family supervision decreases (Dahl, 2008). Affective systems influence behavior and cognitions, increasing vulnerability in social situations (Dahl, 2008). Coping with increased stress demands and psychological vulnerability is influenced by a sense of security, having to do with the early attachment style in close relationships, reflected in, for instance, perceived social support.

In middle adolescence (approximately at age 15–17 years), the majority of pubertal changes have taken place. This is the time when attachment moves increasingly from family to peers. The psychological and social self and also sexual identity are developing most in this period, and a set of cognitive skills and competences in self-control of behavior starts developing across middle adolescence into young adulthood (Dahl, 2008).

In late adolescence (18–19 years and beyond), a gradual sense of personal continuity and an integrated coherent theory of the self develop, and the social network expands. Increased involvement is found in e.g. career choices, sexual identity, personal lifestyle, and moral values (Erikson, 1968).

The brain develops alongside the pubertal development. Neuronal changes with hormonal changes impact strongly the neuronal functions. There is a strong neuronal base for emotional reactions, depression, and impulsivity in adolescence, having to do with the stage-specific development of the brain. The amygdala is in a central role in processing the instant stimuli from the environment and the primary emotions, but the frontal cortex cannot still fully direct the emotional reaction from instant stimuli in adolescents. Even if the amygdala develops early, its function is led by the frontal cortex, which develops relatively slowly compared

with the other brain areas. For girls, it is fully developed already in childhood and for boys it continues to develop at least until the age of 18 years. The amygdala has an important impact on emotional regulation and in situations where rapid decisions should be made. This is part of the neuronal basis in adolescence leading to strong emotional reactions, increasing the risk of impulsive behavior (Paunio & Lehtonen, 2016). While the adolescent is engaging in novel and perhaps risky activities, the prefrontal cortex has not yet matured to the point where risks can be adequately assessed, leading to an incapacity to control risk taking to avoid unhealthy outcomes (Romer, 2010; Romer, Duckworth, Sznitman, & Park, 2010).

As adolescence is a period of biological, social, and psychological changes, it provides a challenge to the concept of personality, self-image, and identity, seen as more consistent across time and place (Calam, 2001). Personality can be defined as a large entity of individual differences in coping mechanisms, capabilities, self-esteem, motives, values, attitudes, and needs, developing from temperament through maturation, experiences, and interaction with the environment (Pervin, Cervone, & John, 2005). Attachment security is predictive of a variety of competencies later in life that are relevant to personality functioning (Bowlby, 1988). Perceived social support is shown to interact with attachment style (e.g. Stanton & Campbell, 2014), with especially friendship support in adolescence predicting later resilient psychosocial functioning (van Harmelen et al., 2017). Identity is seen as a sub-concept of personality, a self-concept, being relatively stable from adolescence onwards (Koenig, Howard, Offer, & Cremerius, 1984). Self-image is based in Erikson's (1968) ego identity and Marcia's (1966) concept of identity. It includes eleven psychosocial areas, the one having to do with behavior is impulse control, i.e. the extent to which the ego is strong enough to ward off various pressures in both internal and external environments. This is especially challenging in adolescence due to the relatively slowly developing frontal cortex. Evidence shows that brain maturation of the frontal cortex is not complete until the third decade of life (e.g. Romer, 2010; Steinberg, 2008). This leads to adolescents having insufficient frontal control to inhibit impulsive drives such as sensation seeking (Romer et al., 2010). Exposure to various forms of stress during childhood predicts later adverse forms of risk taking (Romer, 2010). Stress during adolescence can impact brain development and lead to maladaptive changes later in life, impacting behavior and also stress responsiveness (Sinclair, Purves-Tyson, Allen, & Weickert, 2014).

Ego defense mechanisms are according to the American Psychiatric Association "automatic psychological processes that protect the individual against anxiety and from the awareness of internal and external dangers and stressors" (APA, 1994, DSM-IV). The maturation of defense mechanisms has been shown as part of development from infancy to adulthood (Evans & Seaman, 2000; Vaillant, 1971). If the defensive structure is poorly organized, the frustration tolerance is low (Offer,

Ostrov, & Howard, 1982), making it harder to, for instance, delay gratification or inhibit sensation-seeking behavior.

2.2 Psychiatric disorders in adolescence

The onset of many psychiatric disorders takes place during childhood or adolescence. For instance, in young adults (18–26 years) with psychiatric disorders, 78% have received a diagnosis before reaching the age of 18 years and 58% before the age of 15 years (Copeland, Shanahan, Costello, & Angold, 2011). The average (3– to 12–month) prevalence of any adolescent psychiatric disorder in epidemiological studies has been reported to be 21.8% (Costello, Copeland, & Angold, 2011). Remarkably higher prevalence estimates have also been reported, the 12-month prevalence estimate of any DSM-IV disorder was 40.3% in the National Comorbidity Survey Replication Adolescent Supplement (Kessler et al., 2012). Anxiety disorders are the most common disorders among adolescents, mood, anxiety, and eating disorders being more prevalent among girls and behavioral disorders and substance use disorders more prevalent among boys (Kessler et al., 2012).

2.2.1 Depressive disorders in adolescence

Every tenth adolescent has suffered from a mood disorder during the previous 12 months, lifetime prevalence estimates varying between 14% and 18% (Merikangas et al., 2010; Copeland et al., 2011; Costello et al., 2011; Oldehinkel, Ormel, Verhulst, & Nederhof, 2014). Depression is a disorder of affective functioning linked to cognitive, biological, sexual, and interpersonal processes (Sheeber et al., 2009). According to DSM-5, depressive disorders include major depressive disorder (MDD, including major depressive episode), persistent depressive disorder (dysthymia), disruptive mood dysregulation disorder, premenstrual dysphoric disorder, substance/medication-induced depressive disorder, depressive disorder due to another medical condition, other specified depressive disorder, and unspecified depressive disorder. Major depression (MDD) is characterized by the DSM-5 criteria (APA, 2013); to make a diagnosis of depression, the individual must be experiencing five or more symptoms during the same two-week period and at least one of the symptoms should be criterion 1 or 2 (Table 1):

Table 1. MDD diagnostic criteria.

Criteria 1 and 2	**Criteria 3-8**
Depressed mood most of the day, nearly every day.	Significant weight loss when not dieting or weight gain, or decrease or increase in appetite nearly every day.
Markedly diminished interest or pleasure in all, or most activities most of the day, nearly every day.	A slowing down of thought and a reduction of physical movement (observable by others, not merely subjective feelings of restlessness or being slowed down).
	Fatigue or loss of energy nearly every day.
	Feelings of worthlessness or excessive or inappropriate guilt nearly every day.
	Diminished ability to think or concentrate, or indecisiveness, nearly every day.
	Recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.

The disorder represents a change from the person's baseline, impaired function in social, occupational, and educational domains. Mood disorders also include bipolar disorders, characterized by at least one depressive and one manic (type I bipolar disorder) or hypomanic (type II bipolar disorder) episode. Cyclothymic disorder is a chronic disorder with mood cycling between hypomanic and depressive episodes that do not reach the diagnostic standard for bipolar I or II disorder (APA, 2013).

Epidemiological studies have shown that MDD is relatively rare among children before puberty (Egger & Angold, 2006; Thapar, Collishaw, Pine, & Thapar, 2012), but common among adolescents, from 5% probability in early adolescence up to 20% by the end of adolescence and a 25% lifetime prevalence by adulthood (Kessler, Avenevoli, & Ries Merikangas, 2001). The median 12-month prevalence of MDD from middle to late adolescence has been reported at 4-5% (Thapar et al., 2012). MDD has been shown to be by far the most prevalent form of affective disorder in adolescence, with relatively similar symptoms of MDD among adults (Lewinsohn, Rohde, & Seeley, 1998; Thapar et al., 2012).

Sex and stress hormones work together tuning dopamine responses in the brain during adolescent maturation (Sinclair et al., 2014). Rapid hormonal changes during pubertal development are associated with affect, suggesting that depression is linked to pubertal changes in hormone-brain relations (Graber, Seeley, Brooks-Gunn, & Lewinsohn, 2004; Thapar et al., 2012). Adolescent hormones (estrogen/testosterone) impact brain development and may have different actions on, for instance, dopamine in males and females, which may be distinct from hormone actions in the adult brain. Stress hormones can modulate dopamine neurotransmission and dopamine-mediated cognitive function during adolescence, being important in the context of psychiatric illness (Sinclair et al., 2014).

As girls are about twice as likely as boys to have experienced a depressive episode by the age of 15, pubertal development is suggested to be associated with girls' depressive symptoms (Thapar et al., 2012). There is an emergence of increased affiliative need, especially in girls, during puberty (Patton et al., 2007; Thapar et al., 2012). Social and coping risk factors include low self-rated social competence and poor coping skills, and family-related risk factors include low social support from family and interpersonal conflicts with parents. Personality-related risk factors for depression in adolescence are e.g. self-consciousness, low self-esteem, and low emotional reliance (Lewinsohn et al., 1998).

2.2.1.1 Outcome and predictors of outcome of adolescent depressive disorders

Community and clinic-based studies suggest a remission rate of 60–90% of major depression episodes within one year in adolescence, but also 50–70% recurrence of depressive episodes within five years (Thapar et al., 2012). Depression in adolescence predicts several psychiatric disorders in adulthood, including anxiety disorders, substance-related disorders, and bipolar disorder, and also suicidal behavior, physical health problems, and unemployment (Thapar et al., 2012). This reveals that there is a long-term impact of adolescent depression on functioning into adulthood. Clayborne et al. (2019) showed several psychosocial associations from adolescent depression, e.g. higher odds of experiencing failure to complete secondary school, unemployment, pregnancy, and parenthood, and lower odds of being employed or in tertiary training and entering postsecondary education. Some analyses have also demonstrated significant associations between adolescent depression and outcomes including income, social support, and loneliness (Clayborne, Varin, & Colman, 2019).

Episode duration has been shown to be associated with e.g. subject´s younger age at onset of depression, prior psychiatric history, episode duration before treatment, level of impairment, and presence of Axis I comorbidity in clinical populations (Birmaher et al., 2004; Dunn & Goodyer, 2006; Karlsson et al., 2006). Female sex, older age, high levels of self-reported depression, comorbidity, and PDs have been reported as predictors for *earlier recurrence* (Birmaher et al., 2004; Dunn & Goodyer, 2006; Karlsson et al., 2008).

In treatment studies, poor outcome (higher depression severity) at follow-up has been shown to be associated with e.g. younger age, high baseline depression severity, psychiatric comorbidity, functional impairment, personality features such as hopelessness and lower expectancies for treatment benefits, suicidal ideation and self-injurious behavior, and family conflict (Asarnow et al., 2009; Curry et al., 2006). *Recovery* has been predicted by good response to initial treatment and *recurrence* by nonresponse to initial short-term treatment, female sex, and anxiety disorder (Curry et al., 2011; Kennard et al., 2009; Melvin et al., 2013). Longitudinal

research has estimated that a large proportion of those who experience depressive episodes in adolescence will experience at least one recurrent episode in adulthood (Clayborne, Varin, & Colman, 2019).

2.2.1.2 Treatment of depressive disorders in adolescence

There are several treatment studies on short-term effectiveness of psychological treatments and medication, but studies on long-term effects of treatment interventions are scarce (Thapar et al., 2012).

The most common psychotherapeutic forms for adolescent depression are interpersonal therapy (IPT), cognitive behavioral psychotherapy (CBT), and psychodynamic psychotherapy (Goodyer et al., 2017; Zhou et al., 2015). In adolescence, also family therapy has been shown to impact positively on the treatment of depression (Zhou et al., 2015). Among psychotropic medications, Serotonine-Selective Reuptake Inhibitor (SSRIs), at least fluoxetine, sertraline, escitalopram, have been shown to be effective in meta-analyses, but more evidence is needed and some risks have also been found (e.g. agitation, hypomanic symptoms in some individuals). Short-term treatment in combination with antidepressant medication has in treatment trials (ADAPT, TADS) yielded controversial results (Thapar et al., 2012).

According to the national guidelines for the diagnostics and treatment of depression (Depressio: Käypä hoito- suositus, 2020), the primary treatment for mild and moderate depression among adolescents is CBT and Interpersonal Psychotherapy for Adolescents (IPT-A). For acute treatment, mindfulness-based treatment, supportive psychotherapy, and short-term psychodynamic psychotherapy are also recommended. Family therapy is recommended especially when family factors have a role in the depression of the adolescent. If the psychotherapy has limited response in 1–2 months, psychotropic medication (fluoxetine for patients under 18 years) is advised. A combination of CBT and fluoxetine to prevent relapse is recommended. One primary focus in treatment planning is assessment of suicidality, according to the guidelines. Guidelines with similar content for psychotherapeutic treatment of mild and moderate depression and for psychotropic medication have been tendered by the American Academy of Child and Adolescent Psychiatry for clinical practice (AACAP, Birmaher & Brent, 2007) in the Practice Parameter for the Assessment and Treatment of Children and Adolescents with Depressive Disorders.

2.2.2 Comorbidity of psychiatric disorders in adolescence

Comorbidity is a term from medical epidemiology describing the situation where clearly distinguishable disorders co-occur in a patient (Krueger, Hopwood, Wright, & Markon, 2014; Maj, 2005). Most combinations of psychiatric disorders have a

serious negative impact on functioning (Lewinsohn et al., 1998). Comorbidity is common in adolescent psychiatric disorders. Two-thirds of depressed adolescents have at least one comorbid disorder (Thapar et al., 2012). A 6-12 times higher likelihood of having anxiety has been shown if depressed as an adolescent (Thapar et al., 2012) Comorbidity in psychiatric disorders is reportedly strongly linked to greater symptom severity, treatment resistance, lower level of academic achievement, and suicide attempts and intermediately linked to measures of role functioning and conflict with parents (e.g. Lewinsohn, Rohde, & Seeley, 1995; Melton, Croarkin, Strawn, & McClintock, 2016). Comorbidity impacts negatively on treatment effect, especially PD comorbidity on e.g. reduced motivation, less positive treatment expectations, and more fragile therapeutic alliance (Reich, 2003). Among boys, substance use and disruptive disorders and in girls, anxiety disorders are the most common comorbid disorders in adolescent depression (Lewinsohn et al., 1995). A high comorbidity rate in adolescent disorders emphasizes the importance of conducting a comprehensive diagnostic assessment and the need for interventions that address multiple problems. As depression often follows other conditions, it is important to focus treatment also on the other disorders (Lewinsohn et al., 1998; Melton et al., 2016).

2.3 Personality disorders

The importance of personality for predicting several life outcomes and understanding human behavior is well established. Trait theory of personality assumes that individuals possess broad predispositions, called traits, to respond in a particular way, showing a consistent pattern of behavior, feelings, and thinking (Pervin et al., 2005). The relation between personality traits and PDs is complex, having to do with dysfunctions in several domains. When the traits are maladaptive, inflexible, and cause significant functional impairment and subjective distress, they constitute PDs.

2.3.1 Diagnostic criteria of personality disorders

PDs have been defined as enduring patterns of inner experiences and behaviors with dysfunctions in occupational and interpersonal domains, which have an onset in adolescence or early adulthood, and are stable over time (APA, 2013). The essential features of a PD are impairments in personality (self and interpersonal), functioning, and defense mechanisms. According to the DSM-5 diagnostic system, the following criteria must be met for a diagnosis of PD (APA, 2013):

Table 2. Criteria for a personality disorder diagnosis.

A. Significant impairments in self (identity or self-direction) and interpersonal (empathy or intimacy) functioning.
B. One or more pathological personality trait domains or trait facets.
C. The impairments in personality functioning and the individual's personality trait expression are relatively stable across time and consistent across situations.
D. The impairments in personality functioning and the individual's personality trait expression are not better understood as normative for the individual's developmental stage or sociocultural environment.
E. The impairments in personality functioning and the individual's personality trait expression are not solely due to the direct physiological effects of a substance (e.g. a drug of abuse, medication) or a general medical condition (e.g. severe head trauma).

In DSM-5 (APA, 2013), PDs are classified into three clusters and ten categories; Cluster A: schizoid, schizotypal, paranoid; Cluster B: borderline, narcissistic, histrionic, antisocial; and Cluster C: dependent, avoidant, obsessive-compulsive.

The 10th revision of the International Statistical Classification of Diseases and Related Health Problems, ICD-10 (World Health Organization, 2010), defines disorders of adult personality and behavior (F60-F69) as follows:

"This block includes a variety of conditions and behavior patterns of clinical significance which tend to be persistent and appear to be the expression of the individual's characteristic lifestyle and mode of relating to himself or herself and others. Some of these conditions and patterns of behavior emerge early in the course of individual development, as a result of both constitutional factors and social experience, while others are acquired later in life. Specific personality disorders (F60.-), mixed and other personality disorders (F61.-), and enduring personality changes (F62.-) are deeply ingrained and enduring behavior patterns, manifesting as inflexible responses to a broad range of personal and social situations. They represent extreme or significant deviations from the way in which the average individual in a given culture perceives, thinks, feels, and, particularly, relates to others. Such behavior patterns tend to be stable and to encompass multiple domains of behavior and psychological functioning. They are frequently, but not always, associated with various degrees of subjective distress and problems of social performance."

2.3.2 Dimensional model of personality disorders

The psychiatric diagnostic system has been questioned in recent research, partly because of its categorical nature. There is considerable research showing co-occurrence of diagnosed PDs (Skodol, 2012). DSM-5 aimed at finding a progressive and dimensional alternative to the categorical personality disorder (Axis II) diagnosis system in earlier versions of the DSM, ending up with two versions of diagnosing PDs. The first model of diagnosing PDs is an updated version of the

DSM-IV-TR (Krueger et al., 2014), the other represents a dimensional approach. Comorbidity within the different PD categories occurs in 2.8 to 4.6 diagnoses per patient in adult clinical samples, when PDs are rated categorically (Krueger et al., 2014). This is one reason why the studies of psychopathology are shifting towards a more dimensional mode of assessment (Krueger et al., 2014). Use of polythetic criteria of DSM (minimum number from list of criteria, but no single one is necessary) leads to heterogeneity in patients receiving the same diagnosis, for instance, in borderline personality disorder the number of possible ways of meeting the diagnostic criteria is 256 in DSM-IV-TR (Skodol, 2012). According to the categorical system, therefore, the personality traits just under the cut-point of possible clinical significance are missed. Some research exists among adults, showing that sub-threshold PD difficulties are associated with negative effects on subjective well-being and psychiatric symptoms (Karukivi, Vahlberg, Horjamo, Nevalainen, & Korkeila, 2017).

DSM-5 alternative dimensional models (AMPD) make the co-occurrence of PDs more rational, including multiple dimensions, permitting diagnosis of PD categories Antisocial, Avoidant, Borderline, Narcissistic, Obsessive-compulsive, and Schizotypal. Maladaptive personality patterns not covered by these algorithms are diagnosed as *PD-Trait Specified* (PD-TS). Severity and style of personality dysfunctions are evaluated conjointly through ratings for overall level of personality impairment and specific pathological personality traits. AMPD joins two conceptual planes of personality pathology: 1) disturbances in *self* and *interpersonal* functioning and 2) dimensions of maladaptive personality traits assessed through 5 broad trait *domains* partitioned into 25 narrower trait *facets* (APA, 2013; Waugh et al., 2017). Still, little empirical information exists on the clinical implications of the dimensional scale and where to set the cut-points (Skodol, 2012), especially among adolescents.

Table 3. Alternative model of personality disorders (AMPD) in DSM-5.

AMPD Criterion A	**AMPD Criterion B**
Level of Personality Functioning Scale	PD Trait Domains and Facets
Self: Identity, Self-direction	Negative Affectivity: Emotional Lability; Anxiousness; Separation Insecurity; Submissiveness; Hostility; Perseveration; Depressivity; Suspiciousness; Restricted Affectivity
Interpersonal: Empathy, Intimacy	**Detachment:** Withdrawal; Intimacy Avoidance; Anhedonia; Depressivity; Restricted Affectivity; Suspiciousness
	Antagonism: Manipulativeness; Deceitfulness; Grandiosity; Attention Seeking; Callousness; Hostility
	Disinhibition: Irresponsibility; Impulsivity; Distractibility; Risk Taking; Rigid Perfectionism
	Psychoticism: Unusual Beliefs and Experiences; Eccentricity; Cognitive and Perceptual Dysregulation

2.3.3 Borderline personality disorder

Borderline personality disorder (BPD) is a severe mental disorder characterized by emotional instability, a pervasive pattern of impulsivity, interpersonal dysfunction, and disturbed self-image. BPD is one of the most common PDs. The prevalence of BPD has been estimated in the general population at 1–2% (Paris, 2010), in clinical outpatient settings for adults at 10–20% (Korzekwa, Dell, Links, Thabane, & Webb, 2008; Zimmerman, Rothschild, & Chelminski, 2005), and in inpatients at 40% (Chanen & Kaess, 2012). BPD is the most studied PD, shown to have a phenotype emergent from childhood to early adolescence (Biskin, 2015; Crowell, Beauchaine, & Linehan, 2009; Grant et al., 2008). In BPD, the typical feature is instability, manifested in four key features: 1) emotion, 2) interpersonal relationships, 3) self-concept, and 4) behavior (Hooley, Cole, & Gironde, 2012). People with BPD are at heightened risk of suicide, with completed suicide among 8-10% and adult suicidal behavior among 60–70% (Oldham, 2006).

2.4 Personality disorders in adolescence

According to longitudinal and epidemiological studies, 15% of adolescents in the community meet the diagnostic criteria of PD, a similar rate as reported among adults (Westen, Shedler, Durrett, Glass, & Martens, 2003). PDs have been shown to be diagnosable in adolescence (Fonagy & Clark, 2015; Sharp, Ha, Michonski, Venta, & Carbone, 2012) and to have concurrent validity, but the predictive validity for PDs is mixed (Levy et al., 1999). This is one reason for the debated question of whether a PD diagnosis in adolescence is actually valid. Another debate about PDs in adolescence has been the premise that adolescent PD symptoms may be more changing than the more stable symptoms among adults because of the still developing personality. Still, adolescent PD symptoms have been shown to be as stable as among adults, but adult PDs have shown less long-term stability than previously thought (Melartin et al, 2010; Karukivi, Vahlberg, Horjamo, Nevalainen, & Korkeila, 2017). In BPD, impulsive-type symptoms have been shown to reduce over time, while affective-type symptoms (negative affect, feelings of emptiness) seem more persistent (Meares, Gerull, Stevenson, & Korner, 2011). Dimensional PD scores have generally produced higher relative stability estimates, while diagnoses showed poorer long-term stability (Durbin & Klein, 2006). Crawford et al. (2008) noted that if there was instability in adolescent PDs, instability was also found in clinical psychiatric (DSM-IV Axis I) disorders.

2.4.1 Borderline personality disorder in adolescence

There is evidence that adolescents with BPD, compared with adults, have more acute symptomssuch as suicidal behavior and recurrent self-harm, inappropriate anger, and other impulsive behaviors (Fonagy et al., 2015). The prevalence among adolescents is estimated at 3% in the community (Bernstein et al., 1993; Fonagy et al., 2015), and at 22% in outpatient settings (Biskin, 2013; Chanen et al., 2008a). The rate of BPD may be up to 50% among adolescent inpatients (Fonagy et al., 2015). Commonly, mood disorders and BPD co-occur among adolescents (Winsper et al., 2016). However, there has been reluctance to diagnose a PD among adolescents because of the still developing and changing personality (De Fruyt & De Clercq, 2012; Lofgren, Bemporad, King, Lindem, & O'Driscoll, 1991; Shapiro, 1990), especially BPD, because of the lack of developmentally appropriate PD assessment criteria and also the stigma of the diagnosis (Winsper et al., 2016). The current view is that PDs/BPD can and should be diagnosed when appropriate, the diagnosis being as valid and reliable, at least in middle and late adolescence, as among adults (Fonagy et al., 2015) and should be treated in an early phase (e.g. Winsper et al., 2016). Nonetheless, there is dispute about the age at which the diagnosis should be made and which diagnostic and other measures should be used, as studies focusing especially on early adolescence are lacking.

Except for antisocial personality disorder, there is little research on PDs other than BPD. The APA called for more research pertaining to the efficacy of BPD treatments for adolescents in 2001, BPD not being earlier acknowledged in adolescence, thus leading to missed opportunities for early intervention (e.g. Chanen et al., 2008).

Neurobiological abnormalities in frontolimbic networks are associated with BPD, as are several environmental risk factors, e.g. adverse childhood experiences, heritability estimates for BPD ranging from 35-45% (Chanen & Kaess, 2012). In their meta-analysis, Winsper et al. (2016) reported especially psychosocial risk factor domains in childhood and adolescence for a BPD diagnosis: physical and sexual abuse, maladaptive parenting (maternal hostility, verbal abuse, neglect, parental conflict), posttraumatic stress disorder (PTSD) especially in childhood and comorbidity. Five studies showed a significant association between BPD diagnosis and parental conflict. Comorbid psychiatric disorders increased the risk of BPD, with significant associations between mood disorder and BPD in adolescents. Significantly increased odds were also found for eating disorder in BPD patients relative to control groups (Winsper et al., 2016).

2.4.2 Depression and personality disorder comorbidity in adolescence and adulthood

Comorbid psychiatric conditions, especially psychiatric clinical symptoms (Axis I) and PD comorbidity (Kasen et al., 2007), among adolescents have been shown to increase mental health treatment utilization (Lewinsohn et al., 1995). The level of impairment is higher among adolescents diagnosed with a comorbid PD (Bernstein et al., 1993; Crawford et al., 2008; Korenblum, Marton, Golombek, & Stein, 1990). Also, higher risk for recurrent depressive episodes (Karlsson et al., 2008) and suicide (Brent et al., 1994) are associated with PD comorbidity in follow-up studies. Differences exist in comorbidity rates across the different PD clusters. In an adolescent community sample (Cohen, Crawford, Johnson, & Kasen, 2005), comorbidity between cluster A PDs and depressive disorders was found in 20% and anxiety disorders in 25% of adolescents. The respective percentages for cluster B PDs were 28% and 38%, and for cluster C PDs 23% and 51% (Cohen et al., 2005). Ha et al. (2014) reported a mood disorder rate of 70.6% among adolescent inpatients with BPD compared with 39.2% among inpatient controls without BPD.

Depressive disorder during adolescence has been shown to be associated with a 14-fold risk of dependent PD, a 10-fold risk of antisocial PD, and a 3-fold risk of passive-aggressive or histrionic PD in adulthood (Cohen et al., 2005). Girls with severe hospital-treated anxiety disorders have been reported to have an over 4-fold risk of developing a PD in young adulthood; similar results were not found among males (Kantojarvi, Hakko, Riipinen, & Riala, 2016). Among adults with PDs, more often recurrent than a single episode of depression has been shown, with depressive disorder comorbidity rates being highest in cluster C PDs, followed by cluster B and cluster A PDs (Friborg et al., 2014). Several studies in adults have shown a worse long-term prognosis if BPD and depression co-occur (e.g. Gunderson et al., 2014; Crawford et al., 2008).

2.4.3 Impact of personality disorders on outcome of adult and adolescent depressive disorders

In adults, a 5-year follow-up study on primary care patients with MDD showed that patients with a BPD had spent more time depressed, achieved full remission slower and a higher proportion of them had a chronic depressive disorder (Riihimaki, Vuorilehto, & Isometsa, 2014). In another follow-up study on psychiatric patients with major depression and bipolar disorders, PDs increased the risk for a suicide attempt approximately 2-fold (Jylha et al., 2016). Also, a longer duration of MDD was related to a higher number of personality problems in a meta-analysis (Friborg et al., 2014).

The impact of PDs on the outcome of adolescent depressive disorders has seldom been investigated. Longitudinal associations have been shown between

BPD course and MDD among adults. Failure to remit from MDD was associated with a substantially reduced likelihood of remitting from BPD (Shea et al., 2004). The impact of PDs on depression among adolescents has been reported in some studies. Adolescent PDs have been associated with a greater severity of depression (Hart, Craighead, & Craighead, 2001; Lewinsohn, Rohde, Seeley, & Klein, 1997). Ramleth et al. (2017) used data from an RCT of 77 adolescents (aged 12-18 years) comparing dialectic behavior therapy (DBT) adapted for adolescents and enhanced usual care. They found that a BPD diagnosis and a high baseline level of clinician-rated depressive symptoms predicted higher levels of depressive symptoms at trial completion at 19 weeks. Receiving DBT predicted lower levels of depressive symptoms.

2.4.4 Deviant personality traits in adolescence as predictors of psychiatric disorders and maladaptive development

There is evidence that deviant personality traits in adolescence are associated with later psychiatric disorders. For instance, Hayes et al. (2017) showed that especially low emotional stability is an independent risk factor in adolescence associated with serious mental illness (bipolar disorder, schizoaffective disorder, schizophrenia, other non-affective psychotic disorders) in adulthood. This suggests that personality dimensions may be useful in understanding endophenotypes of serious mental illness (Hayes, J. F., Osborn, Lewis, Dalman, & Lundin, 2017).

Adolescents with BPD traits have been shown to be at increased risk of substance use and mood disorder, poorer life quality, and higher levels of distress later in life (Sharp et al., 2012). Follow-up studies of community samples of adolescents also show that BPD symptoms tend to persist even when formal diagnostic criteria are no longer met (Bernstein et al., 1993; Crawford, Cohen, & Brook, 2001). BPD challenges developmental tasks and perpetuates both psychiatric pathology and functional impairment, risking normal development into adulthood (Wright, Zalewski, Hallquist, Hipwell, & Stepp, 2016). BPD has been shown to disturb the sense of identity and to disrupt interpersonal functioning, identity formation, and self-understanding in relation to peers and romantic partners, which are considered key developmental foci during adolescence (Hill et al., 2013; Kerpelman et al., 2012).

2.4.5 Treatment of personality disorders in adolescence

Several psychotherapeutic interventions have been developed for adolescents with PDs, especially for those with BPD. Dialectical behavioral therapy for adolescents (DBT-A) (Mehlum et al., 2014), mentalization-based therapies (MBT) (Rossouw & Fonagy, 2012), and cognitive-analytic therapy (CAT) (Chanen et al., 2008b; Chanen et al., 2009) have shown promise in RCTs in treating BPD in

adolescence. Unfortunately, there is still a paucity of research on treatment options for adolescents with BPD, and even less for other adolescent PDs. Studies have revealed high levels of psychotropic medication treatment among adolescents with BPD. Evidence for the efficacy and safety of psychotropic medication for symptoms of BPD is sparse (Fonagy et al., 2015).

2.5 Defense mechanisms, depression, and personality disorders

Defense mechanisms are defined as "automatic psychological processes that protect the individual against anxiety and from the awareness of internal or external dangers or stressors" (APA, 2013) and constitute a hierarchy of defensive functioning levels (Bond, 2004). The concept of "defense mechanism" has been suggested to be useful in both research and clinical contexts (Andrews, Singh, & Bond, 1993), applying not only to adults, but also to children and adolescents (Cramer et al., 2006). The defenses are usually divided into mature, neurotic, and immature defense styles (e.g. Andrews et al., 1993), mature indicating good mental health (Smith, Thienemann, & Steiner, 1992; Tuulio-Henriksson, Poikolainen, Aalto-Setala, & Lonnqvist, 1997). Vaillant (1994) suggested defenses be divided into defense styles according to a continuum from mature to immature defense mechanisms (Andrews, Pollock, & Stewart, 1989; Andrews et al., 1993). Adolescent defenses have been divided into a four-factor structure (Ruuttu et al., 2006): mature (comprising sublimation, humor, anticipation, suppression, and rationalization), neurotic (comprising undoing, pseudo-altruism, idealization, and reaction-formation), image-distorting (comprising denial, dissociation, devaluation, isolation, and splitting), and immature (comprising projection, passive-aggression, acting out, autistic fantasy, displacement, and somatization).

Among adults, individuals with MDD have been observed to score lower in mature defense styles and higher in immature and neurotic defense styles (Calati, Oasi, De Ronchi, & Serretti, 2010). Perry and Bond (2012) suggested that more mature defenses might mediate improvement in functioning, while PDs with comorbid psychiatric disorders predict later deficiencies in functioning and well-being (Crawford et al., 2008). Especially immature defense styles have been associated with PD traits (Bond, 2004), and PDs have been shown to cause severe distress and malfunctioning in social relations, functioning, and health (APA, 1994), with defense mechanisms as possible mediators.

Some studies have shown an association between defense styles and PDs (Blais, Conboy, Wilcox, & Norman, 1996; Sinha & Watson, 1999; Vaillant & Drake, 1985; Vaillant, 1994; van Wijk-Herbrink, Andrea, & Verheul, 2011), immature defense styles associating positively and mature styles negatively with PDs. Immature defense style has also more often been associated with BPD than

other PDs (Zanarini, Weingeroff, & Frankenburg, 2009; Zanarini, Frankenburg, & Fitzmaurice, 2013). Virtually no studies exist on defense mechanisms as predictors of PD diagnoses or PD traits.

2.6 Social support, depression, and personality disorders

Social support, from a developmental perspective, forms the basis for an adult's ability to form effective relationships (Bowlby, 1988), including perceived supportive input from the social environment, contributing to well-being, positive adjustment, and personality development (Krokavcova et al., 2008). Subjectively perceived social support reflects early attachments in childhood and may also reflect more stable personality-like qualities (Lakey & Heller, 1988; Leskela et al., 2006).

Parents have been shown to be especially important sources of social support in adolescence in e.g. emotional support and modeling coping strategies (Mackin, Perlman, Davila, Kotov & Kelin, 2017).

Friendship support in adolescence has been established to predict later resilient psychosocial functioning (van Harmelen et al., 2017). Only subjective, perceived social support, not objective support (e.g. number of friends and encounters), was found to be a significant predictor of outcome among depressed adult patients (Leskela et al., 2006).

Low social support and relationship problems have been linked to depression (Clayborne et al., 2019). Many who experience a major depressive episode in adolescence will go on to experience a recurrence in adulthood, with the risk of negative impact on relationships. Those with depression are more likely to select partners who are unsupportive or themselves have a proneness to experiencing depression, which can lead to further relational strain (Clayborne et al., 2019). A higher level of perceived parental support in adolescence has been linked to lower level of suicidality, being a protective factor against adolescent psychopathology. Similar results were not found for peer support (Mackin, Perlman, Davila, Kotov, & Klein, 2017).

Low social support and relationship problems are associated with PDs in adolescence (Chen et al., 2006). Interpersonal dysfunctions, prominent in PDs, might interfere the socialization process from adolescence into adulthood, making social support important to include in outcome research on depression and PDs. Sato et al., (Sato, Fonagy, & Luyten, 2019) found a link between anxious attachment style and higher BPD features, showing that individuals with high rejection sensitivity were more likely to be anxiously attached to significant others. More anxiously attached individuals tend to have biased perceptions of social support, for example perceive less support from their partners (Feeney & Collins, 2019).

3 AIMS OF THE STUDY

The main objectives of this study were to examine the outcome of depressive disorders and the association between depressive disorders and PDs in adolescence and from adolescence to young adulthood in a sample of depressed adolescent outpatients. Change in PD symptoms and the impact of defense mechanisms as predictors of development of PDs by young adulthood were also investigated.

Specific aims of this study were to examine in a sample of depressed adolescent outpatients:

1. Prevalence, course and predictors of adolescent mood disorders in an eight-year follow-up (Study I)

2. Impact of personality disorders (PDs) on treatment and one-year outcome in adolescent depression (Study II)

3. Stability and change of PD symptoms in a one-year follow-up among adolescents (Study III)

4. Defense styles and separate defenses in adolescence as predictors of PDs in an eight-year follow-up (Study IV)

Also some unpublished data are presented.

4 METHOD

4.1 Procedures and participants

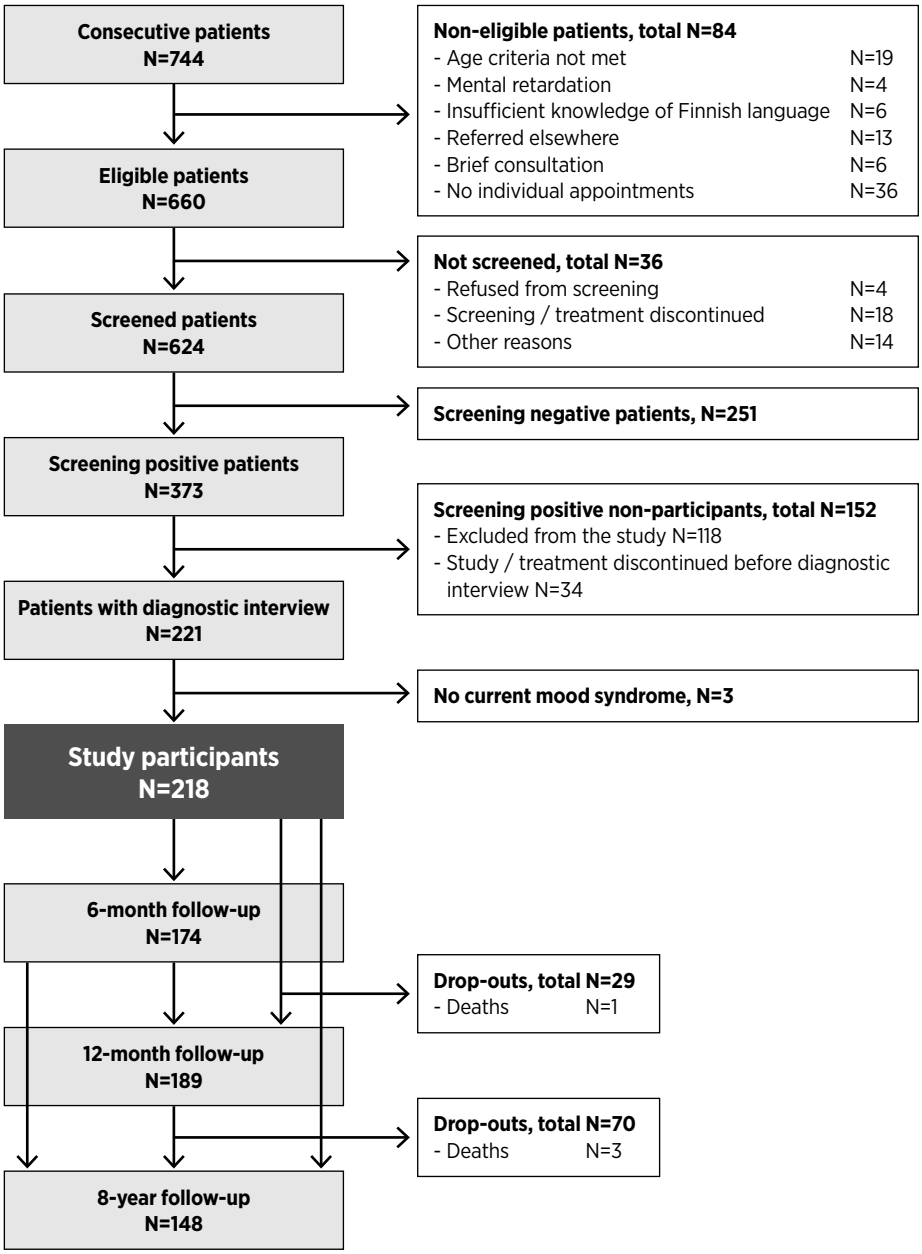
This study is part of the Adolescent Depression Study (ADS), a collaborative study by the Department of Adolescent Psychiatry of the Peijas Medical Health Care District (PMCD), Helsinki University Central Hospital, and the Department of Mental Health and Alcohol Research Unit of the National Institute of Health and Welfare (a merger of the National Public Health Institute and the National Research and Development Centre for Welfare and Health) in Finland. The ADS is a naturalistic, clinical follow-up study of adolescent depressive mood disorders. The study subjects were recruited from outpatient clinics located in the area of PMCD, which serves approximately 210 000 inhabitants in the Helsinki region of southern Finland. The study protocol was approved by the ethics committees of Helsinki University Central Hospital and PMCD.

Participants in the ADS (n = 218) were consecutive adolescent psychiatric outpatients (ages 13–19 years) interviewed for DSM-IV clinical psychiatric and PD diagnoses.

The patients were originally screened by the Beck Depression Inventory-21 (BDI-21; (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and the General Health Questionnaire-36 (GHQ-36; (Goldberg, 1972). Sum scores 10 or more on the BDI-21 and 5 or more on the GHQ-36 were considered as screen-positive (n = 373). Screen-positive patients were given a complete description of the study; if the patient was under 18 years of age, also his / her legal guardian received the description. Written informed consent was obtained from the patients and if they were under 18 years of age also from their legal guardians. Of the screened adolescents, 118 declined participation, 34 dropped out, and 3 did not meet the criterion of an ongoing depressive episode, yielding a final number of 218 participants. A more detailed description of the procedure is written in the article by Karlsson et al. (2006).

The participants were evaluated at baseline and at the 6-month, one-year, and 8-year follow-ups. Baseline evaluations were done with structured diagnostic interviews, self-report, and observer-report scales, with a median of 36 (interquartile range 25–54) days between screen and baseline evaluations. One-year re-evaluations were made with the median time interval being 59.5 (interquartile range 57–63) weeks. After baseline evaluation, the participants were re-evaluated approximately 8 years later with structured diagnostic interviews, self-report, and observer-report scales, the median time interval between baseline and the 8-year follow-up evaluation being 8.2 (interquartile range 1.4) years.

Flow chart of the Adolescent Depression Study (ADS) population



Of the 148 participants at the 8-year follow-up, 126 participated also in the 6-month and 137 in the 12-month follow-up assessments. Those lost to attrition between baseline and the 8-year follow-up (32.1%) did not differ from those who were retained in terms of sex (χ^2=0.19, df=1, p=0.665) or age (F=0.96, p=0.329). Comorbid substance use disorder was more common among those lost to attrition (24.3% vs. 12.8%; χ^2=4.52, df=1, p=0.034), but no other baseline clinical characteristics differed, including depressive disorder diagnosis (χ^2=0.33, df=3, p=0.954), comorbid anxiety (χ^2=0.85, df=1, p=0.357), disruptive (χ^2=0.20, df=1, p=0.652), or eating disorder (χ^2=0.00, df=1, p=0.975), presence of PD (χ^2=0.59, df=1, p=0.441), severity of depressive symptoms/HDRS (F=0.30 or p=0.584), and global functioning/GAF (F=0.54, p=0.462).

All of the outpatients received "treatment as usual" (TAU) of a clinically defined duration in an adolescent psychiatric setting, and after the one-year follow-up 46% of the adolescents continued the treatment. When the participants turned 20 years of age, they were able to contact adult psychiatric services. Some of the participants had also received psychotherapy treatment during the follow-up time. TAU can contain supportive therapy, a combination of family therapy, individual therapy, and psychotherapeutic interventions. These are given usually by a psychologist, adolescent psychiatrist, social worker, or psychiatric nurse.

In Study I, the 148 subjects who participated in the 8-year follow-up were included. After baseline, the participants were re-evaluated at 6-month (n = 126), 12-month (n = 137), and 8-year follow-ups. Only those subjects who participated in both baseline and the 8-year follow-up were included in the study. At baseline, 82.4% of participants were females and the mean age was 16.5 years.

In Study II, 151 patients were drawn, based on participation at both baseline and the one-year follow-up, from the 218 subjects in non-PD and PD comparisons, and the participants were re-evaluated at the 12-month follow-up. Subjects not participating at follow-up (n = 29, 13.3%), those missing data (n = 6, 4.1%), and those with PD diagnosis at baseline only (n = 23 outpatients, 10.6%) or follow-up only (n = 9, 4.1%) were excluded from these analyses. The group with a PD diagnosis at both baseline and follow-up comprised 53 outpatients (35.1%), and the group without PD comorbidity comprised 98 outpatients (64.9%). At baseline, 80.8% of participants were females and the mean age was 16.4 years.

In Study III, 189 subjects in the one-year follow-up were included. After baseline, the participants were re-evaluated at the 12-month follow-up. Only those participating in both baseline and the one-year follow-up were included. Subjects not participating in follow-up (n=29, 13.3%) were excluded from the analyses. At baseline, 81.5% of participants were females and the mean age was 16.4 years.

Altogether 148 participants were re-evaluated at the 8-year follow-up, and 140 participants were subsequently included in Study IV. Only those subjects who participated in both baseline and the 8-year follow-up were included in the analyses.

Subjects with incomplete responses to the Defense Style Questionnaire (DSQ-40) and missing PD data at follow-up (n=8) were excluded from the analyses. At baseline, 82.1% of participants were females and the mean age was 16.5 years.

4.2 Assessments

4.2.1 Diagnostic assessment

Data were obtained by interviewing the adolescents at baseline and at the 6-month, one-year, and 8-year follow-ups. The Schedule for Affective Disorders and Schizophrenia for School-aged Children-Present and Lifetime version (K-SADS-PL), a semi-structured interview with a high level of reliability and validity (Kaufman et al., 1997),. was used at baseline and at the 6-month and one-year follow-ups. The Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I) was used at the 8-year follow-up (First, 1996). DSM-IV PDs were assessed with the Structured Clinical Interview and Screen for DSM-IV Axis II disorders (SCID-II; (First, Gibbon, Spitzer, Williams, & Smith, 1997). The interviews were conducted based on the personality disorder screen, filled in by the participants before the interviews. The screen consists of 119 questions, each corresponding to the interview questions. Completed according to the SCID-II user's guide (First et al., 1997), only the identified symptoms from the screen were the basis for the interview and were evaluated in more detail by the interviewer. There is support (Salbach-Andrae et al., 2008) for the suitability of using SCID-II as a diagnostic instrument among adolescents. The structure of personality pathology as assessed by Axis II criteria in adolescents has been shown to resemble that outlined in DSM-IV Axis II for adults, suggesting that PDs can be assessed similarly in adolescents as in adults (Durrett & Westen, 2005).

All of the research diagnoses (covering Axes I–V) were confirmed in diagnostic consensus meetings where the original investigators and at least one senior clinician reached a consensus on all measures included in the interview. Inter-rater reliabilities were assessed using 13 randomly selected videotaped interviews. For mood disorder diagnoses (MDD, other mood disorder, no mood disorder), weighted kappa was 0.87 (95% CI 0.81, 0.93), and for the HDRS the single measures intra-class correlation coefficient using absolute agreement between raters as the criterion was 0.76 (95% CI 0.52, 0.91).

4.2.2 Assessment of severity of depression, PD symptoms, comorbid psychiatric disorders, psychosocial functioning and social support

The severity of depression as a predictor of outcome was measured with the Hamilton Depression Rating Scale (HDRS) (Hamilton, 1960), a widely used clinician-rated 21-item scale with items ranging from 0 to 4 (symptom absent to severe symptom) or from 0 to 2 for some items. The scale has been shown to have adequate internal consistency and validity among adolescents, especially girls (e.g. Jolly, Wiesner, Wherry, Jolly, & Dykman, 1994).

The PD symptoms that were confirmed in the diagnostic interviews were counted according to each of the PD diagnoses. Also, a total PD symptom count was used. There was some missing information in the PD symptom variables, but it was not systematically related to PD categories.

Comorbid psychiatric diagnoses were assessed in the diagnostic interview. The comorbid diagnosis categories used in the analyses were anxiety disorder, substance use disorder, eating disorder, disruptive disorder (oppositional defiant disorder, conduct disorder, and attention-deficit hyperactivity disorder), and other disorders.

Psychosocial functioning was assessed by the Global Assessment of Functioning Scale (GAF), providing a single rating of functioning and symptoms, used according to the DSM-IV Axis V. Scores range from 10 (e.g. need full-time supervision) to 100 (e.g. superior functioning, no symptoms).

Social support was assessed using the Perceived Social Support Scale-Revised (PSSS-R), which has been shown to have good internal reliability and adequate stability in both adults (Blumenthal et al., 1987) and adolescents (Ritakallio, Luukkaala, Marttunen, Pelkonen, & Kaltiala-Heino, 2010). It is a self-report questionnaire with 12 questions about subjectively perceived social support. The scale is rated on a 5-point Likert-type format (1= “strongly disagree”; 5= “strongly agree”). A higher score indicates higher level of perceived social support. Previous studies on the PSSS-R have identified three separate but correlated factors addressing perceived support from the family, from friends, and from a close friend. We used the subscales of Family and Close friend in this study.

4.2.3 Assessment of personality disorders

DSM-IV Personality Disorders were assessed with the Structured Clinical Interview and Screen for DSM-IV Axis II personality disorders (SCID-II) (First et al., 1997). In Study I, a three-category variable (no personality disorder; borderline personality disorder; other personality disorder) was constructed for the analyses. In Study IV, the presence of any PD diagnosis (yes/no) was used as the outcome measure at the 8-year follow-up and at baseline as a covariate. Also, separate categories for DSM-IV cluster A (paranoid, schizoid, schizotypal), B (antisocial, borderline,

histrionic, narcissistic), and C (avoidant, dependent, obsessive-compulsive) PDs were constructed for the analyses of outcome measure at the 8-year follow-up.

4.2.4 Assessment of defense mechanisms

Defense styles were evaluated with the Defense Style Questionnaire (DSQ-40) (Andrews et al., 1993; Blaya et al., 2004) at baseline. There are two items for each defense mechanism, evaluating 20 individual defenses on a 9-point Likert-type scale. Ruuttu et al. (2006) did not verify in a factor analysis of this sample the three-component structure found in adults (Andrews et al., 1993), deriving instead a four-factor solution: 1) mature defense style, comprising the defense mechanisms sublimation, humor, anticipation, suppression, and rationalization, 2) neurotic defense style, comprising the defense mechanisms undoing, pseudo-altruism, idealization, and reaction formation, 3) image-distorting defense style, comprising the defense mechanisms denial, dissociation, devaluation, isolation, and splitting, and 4) immature defense style, comprising the defense mechanisms projection, passive-aggression, acting out, autistic fantasy, displacement, and somatization. Ruuttu et al. (2006) reported also good psychometric properties of the DSQ-40, including concurrent and discriminant validity, indicating reliability and validity as an instrument for adolescents. There were no major differences in the factor structure of defenses between younger (13-15 years) and older (16-19 years) adolescents, suggesting stability of the DSQ-40 among adolescents (Ruuttu et al., 2006). In the analyses, both the four factors and the separate defenses were used to predict PDs, and defense styles were calculated by averaging the individual defenses in each style.

4.3 Treatment

4.3.1 Treatment received

Because the study was naturalistic, the treatment received was the regular, best available treatment in outpatient clinics with possible periods of hospitalizations. Treatment teams in Finnish secondary healthcare at psychiatric outpatient clinics consist of an adolescent psychiatrist in charge of the treatment, one or more psychologists, a social worker, and one or more psychiatric nurses. The psychosocial treatment at the outpatient clinics consisted of individual sessions (e.g. supportive therapy, psychotherapy) as the basis of treatment and also family and network meetings. A multi-professional network (including social welfare and school personnel) is arranged when needed. The need for psychotropic medication or inpatient treatment is assessed by the treating adolescent psychiatrist.

4.3.2 Treatment characteristics

Treatment received was evaluated by the length of treatment, counted as treatment days from the first treatment session after the baseline interview to the last session before the one-year follow-up; the intensity of treatment, indicated by treatment sessions per month; and breadth of treatment, defined as (1) only individual appointments, (2) individual and family and/or network appointments, (3) individual appointments and medication, and (4) individual appointments, family and/or network meetings, and medication. The frequency of nonattendance, both informed and non-informed, was considered in the analyses. Hospitalization during the follow-up period was recorded as the number of hospital days during the treatment. Treatment variables were calculated for the whole period of treatment (between baseline and one-year follow-up), treatment-related factors covering the first follow-up year from baseline. Treatment-related factors in Studies I and II during the follow-up were drawn from the patient records of the outpatient clinics and inpatient wards. Intensity of treatment contacts/day was calculated by summing up treatment contacts (outpatient and hospital days) and divided by the length of the whole treatment period from baseline to the last contact. Information on the use of antidepressant medication was based on diagnostic interviews and patient records.

4.4 Statistical analyses

In Study I, time to recovery was analyzed with Cox proportional hazards regression, while binary logistic regression was used to predict recurrent episodes and being ill 25% or more of the follow-up. Analyses were first performed with one predictor variable at a time in the model (univariate), and then multivariate analyses were done using the backward stepwise selection method.

Latent profile analysis (LPA) (Gibson, 1959) was applied for HDRS scores to explore different longitudinal profiles or change patterns of depressive symptoms in the data. Profile analysis is a finite mixture method that can be used to identify homogeneous unobserved groups or profiles based on observed variables. The primary aim was to find a small number of easily interpretable groups to be used in the subsequent analyses, not to identify latent profiles per se. Therefore, in addition to the statistical criteria to determine the best solution (number of profiles), emphasis was placed on sufficiently large group sizes and clinically relevant interpretation. After determining the best solution, cases were assigned to the latent profile groups according to their most likely profile group membership and logistic regression analyses were used to assess whether baseline characteristics predict profile memberships.

In Study II, comparisons between depressed adolescents with and without PD were conducted with the Chi-square test for categorical variables and with the Mann–Whitney U test and the t test for non-normally and normally distributed continuous variables, respectively. A hierarchical linear regression model was constructed to analyze whether baseline and treatment-related variables predicted depression outcome at the one-year follow-up.

In Study III, Wilcoxon signed-rank test was used in the analyses of group-level changes in PD symptom counts, while rank-order stability in PD symptoms was analyzed with Spearman rank correlation coefficient. In examining whether comorbidity, HDRS, and social support from the family and close friend at baseline predicted change in the number of PD symptoms, Poisson regression was used. The Generalized Estimation Equation (GEE) (Zeger, Liang, & Albert, 1988) approach was applied to take into account the clustering of repeated observations within individuals over time. After separate analyses of each predictor, all predictors with p-values <0.10 were included simultaneously in a multivariate analysis, adjusted with age, sex, SSRI medication, and number of clinical appointments during the follow-up period. Pearson correlations were used to assess whether changes in PD symptoms correlated with changes in comorbidity, HDRS, and perceived social support.

In Study IV, logistic regression was used to analyze whether baseline defense styles predicted a PD diagnosis at the 8-year follow-up. Separate analyses for having an A, B, and C cluster diagnosis were also conducted. Univariate analyses were done with one predictor variable at a time and variables with p-value <0.15 were considered as probable candidates to have predictive value and were included in the multivariate analyses. In addition to defense styles, analyses were also performed to assess whether separate defenses predict a PD diagnosis at the 8-year follow-up.

Data analyses were done using the Statistical Package for the Social Sciences (SPSS Version 16.0-18.0), In Study I, analyses were conducted using IBM SPSS Statistics 24 and Mplus 7.1 software (Muthén & Muthén, 2012). P-values <0.05 were considered statistically significant.

5 RESULTS

Characteristics of the study populations in Studies I-IV and the main results are summarized in Tables 4 and 5 and in Figures 1 and 2.

Table 4. Characteristics of patient sample in Studies I-IV.

Characteristic	**Study I, N=148**		**Study II, N=151**		**Study III, N=189**		**Study IV, N=140**	
	Baseline	8-year	Baseline	one-year	Baseline	one-year	Baseline	8-year
Age mean, years	16.5	24.5	16.4		16.40		16.51	24.6
Females %	82.40	82.40	80.79	80.79	81.50	81.50	82.10	82.10
GAF mean *GAF over 60 (n)	52.10	64.20	*with PD=2 without PD =29					
PD diagnosis %	44.40	26.00	35.09		41.6	33.7	42.90	24.30
PD diagnosis both baseline and one/8-year %	15		25				15	15
HDRS mean	15.30	5.90	15.17	8.80	15.36		15.36	5.90
HDRS with PD diagnosis mean			17.7	13.7				
HDRS without PD diagnosis mean			13.27	6.66				
Comorbid diagnosis mean/N	N= Anxiety disorder 88, SUD 19, Disruptive disorder 14, Eating disorder 15	N= Anxiety disorder 71, SUD 14, Disruptive disorder 2, Eating disorder 10	N= Anxiety disorder 84, SUD 20, Conduct disorder 18, Eating disorder 15, Other 14		1.99	1.21	1.95	
Treatment during one-year follow-up								
Clinical appointments / year */month (mean)		*4.0		26.11		28.15		
Antidepressant %	52.70		50.80 All 60.40 with PD 45.90 without PD					
Associations between HDRS + PD and treatment			- No significant effect on HDRS score from treatment if PD comorbidity					

HDRS=Hamilton Depression Rating Scale,
GAF=Global Assessment of Functioning,
SUD=Substance use disorder

Table 5. Associations during follow-up in Studies I-IV.

Associations during follow-up	**Study I,** N=148	**Study II,** N=151	**Study III,** N=189	**Study IV,** N=140
Associations between HDRS and PD (Multivariate) during one -year follow-up Studies II and III; 8-year Studies I and IV	+ p<0.05 HDRS profile "Initially moderate, poor distal outcome": BPD	+ <0.000 compared with group with only Axis I	+ <0.05 Avoidant, Dependent, Paranoid. <0.01 Schizotypal, Borderline	
Associations between PD and Comorbidity (Multivariate)	+	+ <0.00 Anxiety disorder, 0.05 Eating disorder, SUD, Conduct disorder compared with group with only Axis I	+ <0.05 All PD categories, except Schizoid and OC	+ <0.01 Cluster B
Associations between HDRS + PD and treatment		- No significant effect on HDRS score from treatment if PD comorbidity		

HDRS=Hamilton Depression Rating Scale, SUD=Substance use disorder, OC=Obsessive-Compulsive

5.1 Mood disorder outcome and predictors in an eight-year follow-up (Study I)

At follow-up in adulthood, 35.8% of the young adults had a mood disorder and 68.2% had at least one psychiatric diagnosis. Mood disorders at baseline and 8-year follow-up are presented in Figure 1.

Of the participants, 44.4% at baseline and 26% at the 8-year follow-up presented with a PD. Mean scores of HDRS (baseline: 13.15 and 17.67, one-year: 6.29 and 13.43, 8-year: 4.00 and 10.68) by groups without and with a comorbid PD are presented in Figure 2. Median time to recovery from the index depressive episode after entering the study was 57.3 weeks. Of the participants, over two-thirds (66.9%) had at least one recurring depressive episode. Over half of all patients suffered from a mood disorder 25% or more of the follow-up time (Study I, Table 1).

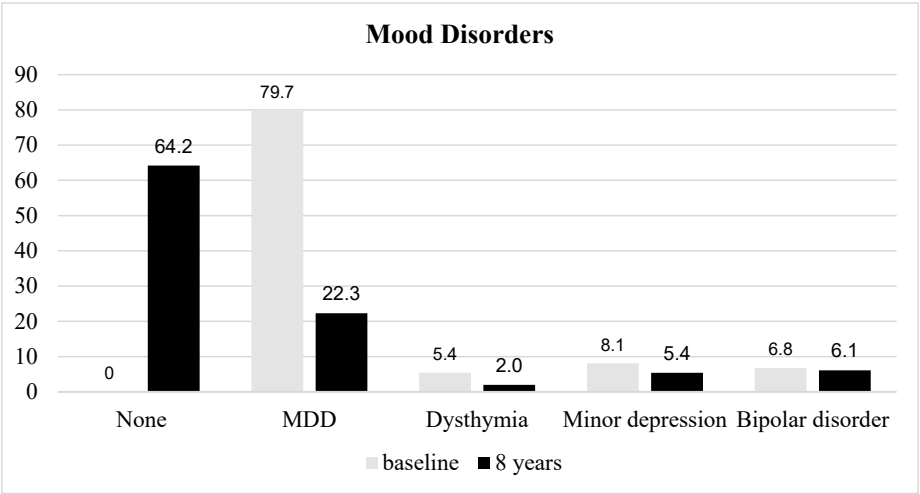


Figure 1. Mood disorders (%) at baseline and at the 8-year follow-up.

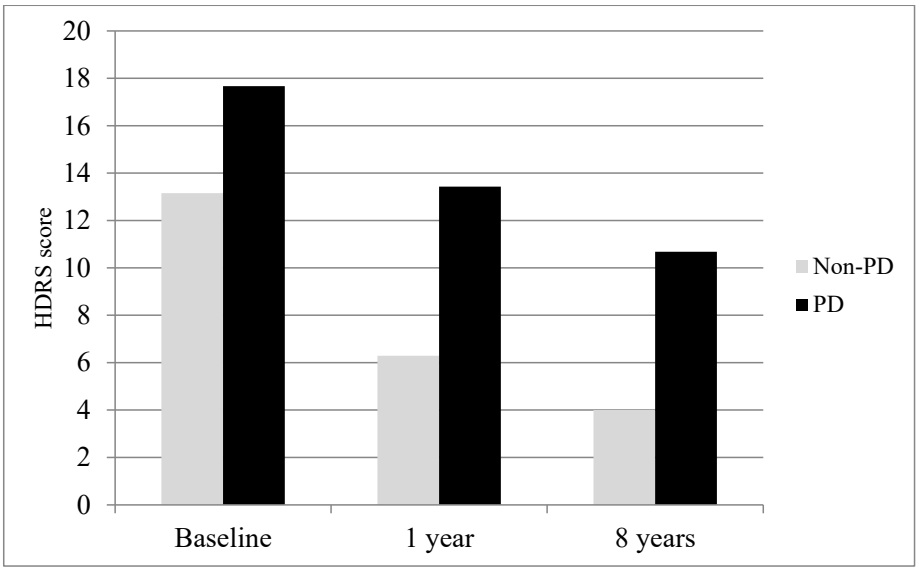


Figure 2. Cross-sectional HDRS scores at baseline and at one-year and 8-year follow-ups by PD group.

Of the baseline clinical characteristics, predictors of *more rapid recovery from the index episode* were minor depression (compared with MDD), lower HDRS score, higher GAF score, and higher age at onset of the first lifetime mood disorder episode (Study I, Table 2). The cumulative survival function by mood disorder diagnosis category is depicted in Study I, Figure 1. More treatment contacts/day during the first year of follow-up and use of antidepressant medication predicted slower recovery (Study I, Table 2). In multivariate analyses, minor depression,

GAF, frequency of treatment contacts/day, and use of antidepressant medication remained significant.

Predictors of lower risk of recurrent mood disorder episode were higher age and dysthymia (compared with MDD; only marginally significant). In multivariate analyses for 2 or more (vs. no) and 3 or more (vs. no) recurrent episodes, higher age of the respondent was the only significant predictor of lower recurrence.

Predictors of more than 25% of time spent ill during the 8-year follow-up (higher risk of suffering from a mood disorder) were more severe depressive symptoms and use of antidepressant medication. Minor depression, higher GAF, and higher age at the first lifetime mood disorder episode were associated with a lower risk (Study I, Table 2). Age at the first mood disorder episode and also use of antidepressant medication remained significant in multivariate analyses.

Latent profiles were analyzed to examine longitudinal change patterns in HDRS scores from baseline to 6-month, one-year, and 8-year follow-ups. A 4-profile solution was statistically better than a 3-profile solution, but the smallest group was quite small (n=12) for the analyses. Furthermore, as the main difference between the two solutions was the group with poor distal outcome in the 3-profile solution (see Study I, Figure 2) splitting in the 4-profile analysis into two groups with only slight differences, the 3-profile solution was chosen for subsequent analyses. The 3-profile solution groups were as follows: 1) initially mild, rapid decrease, good distal outcome, 2) initially moderate, poor distal outcome, and 3) initially most severe, good distal outcome (Study I, Figure 2).

In the univariate analyses predicting profile memberships, female sex, bipolar disorder (compared with MDD), comorbid anxiety and eating disorders, and PDs predicted membership in group 3 ("initially most severe, good distal outcome"), using the initially mild profile as the reference group (Study I, Table 3). A lower GAF, younger age at onset of first mood disorder episode, treatment intensity, and antidepressant medication were also significant predictors of this profile. In the multivariate analyses, bipolar disorder, comorbid anxiety and eating disorders, lower global functioning, and younger age at mood disorder onset remained significant predictors of the group 3 profile.

Significant predictors for profile membership in group 2 ("initially moderate, poor distal outcome") in the univariate analyses were female sex, eating disorder, BPD, and marginally also lower GAF score (Study I, Table 3). Female sex and borderline personality disorder were significant also in the multivariate model (Table 5).

In the final analyses, group 2 ("initially moderate, poor distal outcome") was analyzed against group 3 ("initially most severe, good distal outcome"), with marginally significant associations between PD other than BPD and a lower risk of being in group 2 and higher GAF score predicting membership of the group 2 profile.

5.2 Depression outcome in a one-year follow-up of adolescent outpatients with and without comorbid PDs (Study II)

At baseline, 35.1% of the participants had a comorbid PD, 55.6% an anxiety disorder, 13.2% a conduct disorder, 9.9% an eating disorder, and 2.6% another disorder (Study II). Of the participants, 25% had a PD both at baseline and at the one-year follow-up.

Adolescent outpatients with comorbid PDs had a different diagnostic profile at baseline compared with depressed patients without PD. PD comorbidity was associated with a higher proportion of comorbid psychiatric disorders, such as anxiety disorders, eating disorders, and substance use disorders. The group with PD comorbidity had higher depression scores (HDRS) both at baseline ($t = -4.364$, $p < 0.001$) and at the one-year follow-up ($t = -5.79$, $p < 0.001$) than those without PD comorbidity (Study II, Table 1). PD comorbidity had the strongest impact on depression outcome of the selected independent variables in the hierarchical linear regression model ($p<0.001$) (Study II, Table 3).

No significant differences in treatment status were found between the two groups at the one-year follow-up. Of those with and without PDs, 41.5% and 49%, respectively, were no longer in outpatient treatment at the one-year follow-up (Study II, Table 2). Treatment attendance, duration, or intensity did not differ between the two groups at a statistically significant level. The breadth of treatment was higher among subjects with PDs, the PD comorbidity group being treated with a larger variety of treatment methods simultaneously (e.g. individual appointments, family meetings, and medication) and more often treated with psychotropic medication than the non-PD group (Study II, Table 2). Also, the impact of treatment variables on depression was analyzed in the two groups with or without PD comorbidity, showing no significant impact. Treatment variables were not associated with depression outcome at follow-up for those with PD comorbidity, but for the group without PDs, breadth of treatment was associated with better depression outcome.

5.3 Change in PD symptoms and predictors of change in a one-year follow-up of depressed adolescents (Study III)

At baseline, the participants had 1.99 comorbid diagnoses, at follow-up 1.21. The mean number of clinical appointments was about 28 during the one-year follow-up period, with 50.8 of the participants receiving antidepressant medication during this period (Study III, Table 1).

The most common PD categories with four or more symptoms (the diagnostic cut-point in most PD categories) were borderline and avoidant at baseline, and borderline and dependent at the one-year follow-up. Subjects presenting with PD symptoms remaining below the diagnostic threshold ranged from 13% (antisocial) to 37% (paranoid) at baseline and from 9% (antisocial) to 26% (paranoid) at the one-year follow-up (Study III, Table 2).

There was a significant mean level change in all diagnostic categories for PD symptoms, more likely in the direction that the total number of PD symptoms decreased rather than increased. The symptom decrease proportion varied between 13.2% and 34.4%, and the symptom increase varied between 7.4% and 20.1% in the different PD categories. The rank order stability (Spearman rank correlation rho) ranged from 0.38 (dependent) to 0.58 (borderline), but was low (0.22) for schizoid PD symptoms, with the total symptom count having the highest rank order stability of 0.63 (Study III, Table 2).

Both baseline comorbidity of clinical psychiatric disorders and severity of depression had a main effect on the overall level of most PD symptom categories. Higher perceived social support from close friends was associated with less PD symptoms among avoidant and schizoid PDs. The opposite association was found between social support from close friends on both histrionic and narcissistic PD symptoms.

In multivariate analyses, several significant interactions were found between time and comorbidity, HDRS score, and social support on PD symptom outcome (Study III, Table 3). Comorbidity and HDRS score level interacted on PD outcome in nearly all PD categories, showing higher scores of PDs if there were higher scores of HDRS and comorbidity. Social support from a close friend interacted with some PD categories, with lower scores of schizotypal, narcissistic, and antisocial PD symptoms, family social support showing similar interactions with paranoid PD symptoms. There were also some interactions between time and the adjusted factors (gender, age, antidepressant medication, and number of clinical appointments) on the PD symptoms (data not shown in research article). Weaker improvement was associated with female gender in histrionic symptoms ($p=0.007$) and older age in dependent symptoms ($p=0.054$). For schizoid PD symptoms, older age was associated with better outcome ($p=0.028$). A larger symptom decrease was found for those with antidepressant medication during follow-up for schizotypal ($p=0.011$), paranoid ($p=0.026$), and obsessive-compulsive ($p=0.049$) PD symptoms.

Correlations were measured between changes in symptoms, HDRS score, comorbidity, and social support (Study III, Table 4). Significant correlations were found between changes in comorbidity and PD symptoms in all PD categories, except paranoid, histrionic, and narcissistic. All correlations were positive, indicating that decreases in PD symptoms were associated with a decrease in the number of comorbid diagnoses. The strongest correlations were found between

the total PD symptom count and BPD symptoms. Only one correlation was found between schizoid PD symptom change and change in reported family social support (Study III, Table 4).

5.4 Defense styles and separate defenses as predictors of PDs from adolescence into adulthood (Study IV)

The most common comorbidity was one Axis I diagnosis in addition to mood disorder. Of the outpatients, 15% had a PD diagnosis at both baseline and the 8-year follow-up. Four in ten (42.9%) had a PD diagnosis at baseline and one-quarter (24.3%) at the 8-year follow-up (Study IV, Table 1).

Cross-sectional correlations were calculated. Statistically significant correlations were found between PDs at baseline and depression scores (HDRS), Axis I comorbidity, image distorting, and immature defense styles. A high HDRS score correlated with Axis I comorbidity, image distorting, and immature defenses, while a mature defense style correlated negatively with higher HDRS.

In univariate analyses, depression severity, PD diagnosis, and immature defense style at baseline were associated with adult PD diagnosis, but these became nonsignificant in the multivariate analysis (Study IV, Table 2). Neurotic and immature defense styles in adolescence were associated with PD diagnoses in young adulthood, while mature defense style did not associate negatively with later PDs. Cluster C (obsessive-compulsive, dependent, avoidant) was the most common PD at follow-up, the strongest predictor for it being neurotic defense style at baseline. Predictors at baseline for a later B cluster (borderline, narcissistic, histrionic, antisocial) PD diagnosis were comorbidity and neurotic defense style, image-distorting defense style being the strongest predictor for a later A cluster (paranoid, schizoid, schizotypal) PD diagnosis, but there were only few A cluster diagnoses at follow-up (n=5). In multivariate analysis, the separate defenses displacement, isolation, and reaction formation were the strongest and only statistically significant predictors of a PD diagnosis at follow-up, when adjusted for baseline covariates, including also PDs at baseline (Study IV, Table 3).

6 DISCUSSION

6.1 Summary of main findings (Studies I-IV)

Adolescent depression outcome was worse if there was a comorbid PD diagnosis, over both the short and the long term. Especially BPD was associated with worse outcome of depression from adolescence into young adulthood. It was common to have a comorbid PD, with 44.4% of the participants presenting with a PD in adolescence and up to 26% in young adulthood.

The outcome of adolescent depression into adulthood showed its severe nature and high continuity in psychopathology. Median time to recovery from the index depressive episode after entering the study was long (57.3 weeks), and over two-thirds of participants had at least one recurrence. Earlier age at onset of first lifetime episode was a risk factor for longer time to recovery. The only factor to predict recurrent episodes was younger age of the adolescent. Over half of all the patients suffered from a mood disorder at least 25% of the follow-up time from adolescence into young adulthood. Earlier age at first episode and use of antidepressants were predictors of time spent ill. Treatment breadth did not impact positively on the outcome of depression in adolescents with a PD, but those without a PD gained from a larger variety of treatments.

Change in PD symptoms in adolescents was similar to that in adults. Decrease in the severity of depression and in the number of comorbid diagnoses in most PD categories correlated positively with decrease in PD symptoms, showing co-variation between symptoms of PDs and other psychopathology. Attachment style might impact PD change during treatment. Perceived social support from friends predicted a decrease in schizotypal and narcissistic PD symptoms, and support from family predicted a decrease in paranoid PD symptoms.

The separate defenses of displacement, image-distorting, and reaction formation in adolescence were the strongest predictors of adulthood PD. All three defenses are considered mental inhibitions, with the function of keeping threatening ideas, memories, or feelings from awareness**.** Neurotic and image-distorting defense styles in adolescence were associated with PDs in young adulthood, while mature defense style did not associate negatively with later PDs. Even when controlling for PD diagnosis in adolescence, the strongest predictors of a PD diagnosis in young adulthood were defense styles and some separate defenses.

6.2 Impact of PDs on outcome and treatment of depression

These results add to previous findings on adolescent depression the important notions of differences in outcome and treatment for those with and without comorbid PDs. There is also a significant difference in terms of the number of comorbid diagnoses, and consequently, the overall severity of the psychiatric condition, results in line with earlier research (e.g. Fonagy et al., 2015).

The results on dimensional, symptomatic outcomes of depression were consistent with previous studies analyzing the outcome of diagnosed depressive disorder (e.g. Melvin et al., 2013). In the follow-up from adolescence into young adulthood, depression and other psychiatric disorders were common even after 8 years from the initial psychiatric treatment. In accord with previous results presented in a meta-analysis (Clayborne et al., 2019) (mean age 15.57 years, range 11–19), over one-third of patients had a mood disorder and two-thirds had at least one psychiatric diagnosis. The longitudinal patterns of depression (HDRS scores) revealed that especially BPD and female sex predicted poor outcome, even with an initially moderate profile. Depressed adolescents with a comorbid PD diagnosis compared to those without PD diagnosis had higher initial depression scores. These results are consistent with the affective instability dimension underlying mood disorders and cluster B PDs (Shea et al., 2004). Some common factors could reflect several possible etiologies, e.g. a shared genetic substrate, a shared temperamental vulnerability such as neuroticism, or environmental impacts such as early abuse or neglect (Klein & Schwartz, 2002; Shea et al., 2004). BPD might also impact the way a patient experiences depression, highlighting the need to see the different contents in self-reported depression symptoms, rather than only the number of symptoms.

Although patients with PDs were more impaired, there were few differences in the kinds of treatments offered to depressed patients with or without PDs. In contrast to some studies among adults (e.g. Fava et al., 1994; Mulder, 2002), but in agreement with others (e.g. Newton-Howes, Tyrer, & Johnson, 2006), the naturalistic treatment outcome for adolescents with comorbid PDs was poorer than for those without PDs. Only few associations were observed between the treatment variables and depression outcome, and none were identified among those with PD comorbidity. The decrease in depressive symptoms was larger among patients with no comorbid PD during the same follow-up time, the decrease being associated with treatment breadth. Interestingly, treatment compliance did not differ between the two groups, a finding that contradicts earlier studies (e.g. Martino, Menchetti, Pozzi, & Berardi, 2012).

Consistent with previous studies (Cailhol et al., 2013; Fonagy et al., 2015), those with PD comorbidity were more often treated with psychotropic medication, but

the medication was not associated with better treatment outcome. Comorbid PD in the treatment of depression among adults has been shown to be associated with an increased risk of non-remission following antidepressant treatment (Bock, Bukh, Vinberg, Gether, & Kessing, 2010), but the opposite results have also been published (Kool et al., 2005). Biskin et al. (2013) suggested in a review of risks and side-effects of psychotropic medication caution in medicating adolescent patients with PDs (BPD), calling for more research to explore the gains of medications in these patients.

A negative association existed between treatment and both *time spent ill* and *time to recovery*, indicating that those ill longer and thus with a more severe psychopathology were offered more treatment. The finding that breadth of treatment was not associated with better depression outcome in patients with comorbid PD suggests the need to target treatments. On the other hand, for depression without PDs, breadth of treatment as such had a positive impact on treatment results. Prior research (Dowell & Ogles, 2010) has suggested that family appointments in combination with individual appointments may be useful in the treatment of youthful depression. The finding that there were no differences in psychosocial treatment content or length among those with or without comorbid PDs indicates the systematic need to assess also PDs in depressed adolescents. Previous research has shown that targeted treatments are more effective for youth PDs, especially BPD (Fonagy et al., 2015; Mehlum et al., 2014).

6.3 Change in PD symptoms during follow-up

In line with earlier research (e.g. Cohen et al., 2005), there was a significant overall decrease in PD symptoms in the one-year follow-up. Schizoid, antisocial, obsessive-compulsive, and dependent symptoms showed less change during the follow-up, suggesting that some DSM-IV-based PDs and aspects of categories may be more trait-like (Hopwood et al., 2013; Sanislow et al., 2009). Also, older age was associated with weaker improvement of dependent PD symptoms. Rank order stabilities were consistent with some studies (Ferro, Klein, Schwartz, Kasch, & Leader, 1998), but lower than in others (Hopwood et al., 2013; Melartin, Haukka, Rytsälä, Jylhä & Isometsä, 2010). Depression might impact these results, as PD symptoms were shown to change in concert with changes in clinical status.

PD symptom levels at follow-up were associated with baseline depression severity and comorbidity of clinical disorders in most categories, results agreeing with reports among adults (Markowitz et al., 2007; Melartin et al., 2010). *Changes in PD symptoms* during the follow-up were not associated with comorbidity or depression severity. Treatment impacted some PD categories. Antidepressant medication was associated with a decrease in obsessive-

compulsive, schizotypal, and paranoid PD symptoms. More clinical appointments were associated with an increase in obsessive-compulsive PD symptoms. These results stress the need to focus treatment interventions according to specific symptom contents among depressed adolescents.

Subjectively perceived social support has earlier been found to be a significant predictor of outcome among depressed patients (Leskela et al., 2006). This shows that interpretations of social relations play an important role also in the evaluation of psychopathology and in treatment needed. *Perceived social support* from a close friend was a predictor of PD symptom decrease for schizotypal, narcissistic, and antisocial categories during the one-year follow-up. This positive effect likely reflects the increasing importance of friendships in adolescence. Attachment security might be higher for those with higher perceived social support, as others are important in the regulation of security. PD decrease might be explained by attachment security. The treatment response might be better among adolescents with a more secure attachment style. In accord with earlier research (van Harmelen et al., 2017), especially friendship support in adolescence was important in PD outcome, predicting later resilient psychosocial functioning. Contrary to earlier research (e.g. Mackin et al., 2017), parental or family social support was not in most PD categories associated with positive outcome, except for paranoid and antisocial PD symptoms. Social and coping risk factors for depression in adolescence are e.g. low self-rated social competence and poor coping skills. Family-related risk factors include low social support from family and interpersonal conflicts with parents (Lewinsohn et al., 1998). Social competence and coping skills are probably not as developed in individuals with a PD, representing a risk factor for depression in adolescence.

The associations between comorbidity change and change in avoidant, dependent, obsessive-compulsive, schizotypal, schizoid, borderline, and antisocial symptoms are in accord with results of Crawford et al. (2008), showing that instability in comorbidity correlates with instability in PDs among adolescents. Comorbidity is typical within PD categories and also between psychiatric disorders. A wide range of psychopathology is expected to influence interpersonal skills and personal competencies, potentially impacting negatively the development and life experiences of adolescents. Zimmerman et al. (2005) found that higher comorbidity rate is associated with greater personality pathology among adults.

In line with results showing BPD and MDD are associated longitudinally (Shea et al., 2004), change in BPD symptoms was associated relatively strongly with change in depressive symptom severity (HDRS), not supporting the view that BPD has an independent course from depression (Gunderson et al., 2004). A higher comorbidity and depressive symptom rate impacted PD symptoms negatively in the one-year follow-up. There was also a correlation between change in PD symptoms and change in depression severity, the strongest correlations being

between depression symptom change and change in total PD symptom count and BPD symptoms. This finding supports the view that BPD and depression share some latent common factors (Klein & Schwartz, 2002; Shea et al., 2004).

Almost no correlations were found between PD symptom change and change in reported social support. This suggests that social support is more independent from psychiatric symptoms, in agreement with earlier findings in adults (Leskela et al., 2006). Lower perceived social support may not be explained by depression or other forms of psychiatric illnesses, but rather is a more stable trait interacting with attachment style (Stanton & Campbell, 2014).

Prevalences of the different PDs were mostly similar to reports among depressed adults (Zimmerman et al., 2005), avoidant and borderline PDs being most prevalent. Some PDs (dependent, schizotypal) were much more prevalent among adolescents. As it is common for psychiatric disorders to co-occur, a more dimensional system to detect personality pathology and other comorbid symptoms is needed, showing more accurately the whole psychiatric illness. Also, subthreshold PD symptoms and not only symptoms above the diagnostic cut-points should be focused on in diagnosing and planning the treatment. A dimensional approach may be necessary for the future development of diagnostic strategies and treatments for adolescents (Melton et al., 2016).

6.4 Predictors of having a PD in young adulthood

Neurotic defense style emerged as the most prominent predictor of any adult PD when adjusting for baseline covariates, including also PD and depression, in adolescence. In accordance with earlier research, neurotic defense style did not change during treatment (Schauenburg, Willenborg, Sammet, & Ehrenthal, 2007). Neurotic defense style seems to be more independent from psychiatric disorders. Neurotic defense style predicted cluster B PDs, mostly BPD in this study. Earlier studies have shown that BPD patients have presented more often with immature defense style than with other PDs (Zanarini et al., 2009).

The separate defenses of displacement, isolation, and reaction formation predicted adult PDs over and above baseline PD diagnoses. *Displacement* is redirecting of emotions to a different and less valued target than that giving rise to the emotions (Vaillant, 1992). The defense *isolation* is an unconscious separation of emotion from the memory or events that evoked it. *Reaction formation* reduces anxiety by taking up the opposite feeling, impulse, or behavior, thereby hiding the true feelings or emotions (Vaillant, 1992). Common to all three is that emotions are reacted to in a malfunctional manner; emotion and response are not targeted to the person or event evoking the emotion, rather the emotion is separated from its true target or the reaction is not in accord with the emotion, instead being

its opposite. All three defenses are considered *mental inhibitions* in DSM-IV (APA, 1994), with the function of keeping potentially threatening ideas, feelings, and memories from awareness. Mental inhibitions are considered "higher level neurotic" defenses; they may lead to difficulties in interpreting or communicating emotions, thus continuing malfunctions in social relations and thereby risking the "normal" development from adolescence into adulthood. Clinically, mental inhibition defenses make the association with adult PDs understandable, given that cluster C (fearful, anxious) was the largest group of PDs in this study. These results suggest that some individual defenses may be specific enough to be effective predictors of PDs, although Vaillant (1994) stated that only defense styles should be considered, not separate defenses. These results warrant further investigation and therefore should be considered as only suggestive.

Unexpectedly, mature defense style was not associated negatively with later PDs. This finding contrasts with findings from earlier studies (Sinha and Watson, 1999), suggesting that mature defenses promote well-being as they serve to protect against anxiety. This result might be due to the bias towards less mature defenses in the study sample because all adolescents were depressed. Age was not associated with PDs in young adulthood, even though there are studies showing that maturation in defenses may impact personality development (Vaillant, 1976). These results showed that mature defenses did not protect from PDs later among depressed adolescents. The reason might be that the 'mental inhibition defenses' (displacement, isolation, and reaction formation in DSM-IV) predicted PDs in young adulthood, and this study (IV) showed that the factor "distorted emotions" was a key factor in PD development. Malfunctions in interpreting and communicating emotions among depressed adolescents might lead to more negative interpretations, increasing difficulties in social relations and in combination with impulsive features increasing emotional instability and behavioral problems.

Instability earlier in life has been linked to serious psychiatric disorders in adulthood and is seen as a hallmark of BPD (Hooley et al., 2012). Four key features have been found in BPD: intrapersonal, interpersonal, emotional, and behavioral challenges (Hooley et al., 2012). Instability in interpersonal relations in BPD is reflected in e.g. angry outbursts triggered by interpersonal events, such as rejection or disappointment with instable representations of others, making the interpretations of social situations difficult and social relations unsafe (Hooley et al., 2012). In line with the results of this study, these are related to malfunctions in interpreting and communicating emotions. Also, the depressive cognitive impairments are more severe for those with comorbid PDs than in those with depression but without PDs. When there is instability, the distortion might impact behavior and the view of others and self, leading to even more instability. One study (Jennings, Hulbert, Jackson, & Chanen, 2012) showed that youth with BPD had impaired capacity to differentiate and integrate the perspective of self with

the perspective of others, compared with patients with MDD. Impairments in the theory of mind (mentalization) in adolescents with BPD are found to be due to over-interpretative mental state reasoning (Sharp et al., 2012), lending support to the view of defense mechanisms distorting the interpretation of emotions and mental states in demanding or stressful situations for persons presenting with a PD.

The prevalence of diagnosed BPD declined with time from adolescence to young adulthood, but psychosocial functioning among patients with BPD in adolescence was low in many cases in young adulthood. This is in line with earlier research results, where some BPD symptoms tended to persist even when the diagnostic criteria were no longer met and good psychosocial functioning was only attained by 60% of BPD patients in a 10-year follow-up (Biskin, Paris, Renaud, Raz, & Zelkowitz, 2011; Zanarini, Frankenburg, Reich, & Fitzmaurice, 2010). Abuse and other adverse childhood experiences, relational difficulties, and maladaptive parenting are risk factors for PDs (at least BPD) in adolescence and adulthood. Other factors, such as genetic and biological factors, also have a role in the development of PDs (Chanen & Kaess, 2012).

6.5 Methodological considerations

6.5.1 Strengths of the study

The study population (N=218) was rather large and the assessments were comprehensive, based on well-established scales, both self-reported and observer-rated. The diagnostic interview instruments (K-SADS-PL, SCID-I, SCID-II) were widely used, valid, and reliable. The sample was representative of consecutively referred adolescent outpatients. Compared with prior naturalistic clinical research on adolescent depression, the study included a wider spectrum of mood disorders and accompanying disorders. The results are generalizable to adolescent psychiatric outpatient populations, although generalizations to other cultures should take into account possible differences between healthcare systems (e.g. mixed child-adolescent clinical populations vs. strictly adolescent-aged populations in Finland). There were several follow-up points and in Studies I and IV the long follow-up period from adolescence to young adulthood is a major strength, as long-term follow-ups covering this transitional period are scarce.

The number of drop-outs from baseline to the one-year follow-up was relatively low (29, 13.3%) and moderate at the eight-year follow-up (70, 32.1%). The drop-out rate by young adulthood is comparable to figures in earlier studies (Naicker, Galambos, Zeng, Senthilselvan, & Colman, 2013). Those not participating did not differ from those who remained (n=148) in terms of sex, age, and baseline clinical characteristics, but comorbid substance use disorder was more common among

those lost to attrition, consistent with previous studies (Buckman et al., 2018) showing higher attrition rates among subjects with substance abuse.

In PD assessments, also symptoms under the diagnostic cut-point were analyzed dimensionally, allowing a more detailed analysis of the symptoms and their changes. The long follow-up time shows the impact of PDs on the outcome of depression and the impact of PD and defense style in adolescence on adult personality disorders.

6.5.2 Limitations of the study

The relatively large drop-out rate among screen- positive subjects at baseline is a weakness of this study. The screening procedure was rather stringent and may have excluded some of the outpatients with milder depressions. As the drop-outs or those refusing to participate scored lower on the screening instruments, it is likely that the subjects of this study represent those with more severe depression than those lost to attrition. As females are more prone to depression in adolescence and they are more likely to seek help, females were overrepresented in the ADS study. In the follow-ups, there were even more females than males, making analyses of gender differences difficult.

Only the adolescents themselves were interviewed, as depressive disorders were the primary focus of this study. Adolescents can be considered valid informants of their own depressive symptoms and other "internalizing" disorders, although the use of adolescent informants only may have resulted in lower estimates of "externalizing" disorders (e.g. conduct and substance use disorders). In this regard, lack of interview data from parents and teachers can be seen as a limitation. However, complementary data were available from clinical records, including data collected from the family and school as part of regular clinical work.

Age at onset data were obtained retrospectively, which can be considered a limitation. In the eight-year follow-up, the latent profiles of depressive symptoms were only suggestive regarding the last time interval and should be treated merely as patterns of observed state at the available measurement points, not suggesting that depressive symptoms developed linearly between the assessments. Examination of mood disorder interviews backwards from the eight-year follow-up to the one-year follow-up was not optimal for gaining an accurate evaluation of the course of mood disorders and warrants some caution in the interpretation of the results related to number of episodes or time spent ill.

Despite the relatively large study population, the small cell size in some categories precluded some detailed analyses of interest, for example, individual comorbid psychiatric diagnoses. Some PD categories might be underrepresented in naturalistic clinical studies because of, for instance, social inhibitions in some PD categories that might negatively affect proneness to seek psychiatric treatment. The results may not be in themselves generalized to populations other than adolescent

populations, and further research on predictors of depression and PDs should be conducted with larger samples of the different PD categories. Also, the GAF scale has, at least in one study (Haggerty et al., 2014), demonstrated only fair reliability in clinical settings among adolescents.

7 CONCLUSION AND IMPLICATIONS

7.1 Conclusions

Depression among adolescents is a severe, highly comorbid, and recurrent disorder. Comorbid disorders – including PDs – are common and they are associated with worse outcome of depression and have a negative impact on treatment. When treating youthful depression, also comorbid clinical psychiatric disorders and PDs should be recognized and treated. The co-variation between symptoms of PDs and other psychopathology indicates a need to treat these disorders simultaneously.

Depression in adolescence and its comorbid disorders commonly continue into young adulthood and lead to poor general functioning. Early detection of psychopathology and intensive treatment at both the individual and the family level are necessary to avoid later negative development.

7.2 Clinical implications

In guidelines for assessment and treatment of adolescent depression (Depressio: Käypä hoito suositus, 2020, AACAP, Birmaher & Brent, 2007), CBT and IPT-A are recommended as primary treatment. Fluoxetine or other SSRI medication in combination with psychotherapy is recommended if the psychotherapeutic treatment response is not sufficient. Results of the present study showed that breadth of treatment had a positive impact on treatment results only for those depressed adolescents without a comorbid PD, indicating that treatment of depression produces different responses in adolescents with or without comorbid PDs. It would be relevant to evaluate also PD features for depressed adolescents. A PD, especially BPD, was a predictor of poorer outcome of depression in both the short and the long term. If the adolescent has a comorbid PD such as BPD the psychotherapeutic treatment should be directed more to treating the BPD. Also, BPD might impact the way a patient experiences depression, revealing the importance of focusing on contents in self-reported depression symptoms, rather than only on the number of symptoms.

PDs are prominent in adolescents and are mostly as changing (or stable) as in adults. Identification of deviant personality traits or disorders is important already in adolescence. Early identification of PDs and increased information about their risk and resilience factors are important also from the perspective of early and targeted interventions for PDs, as PDs are among the most common disorders treated by psychiatrists (Zimmerman et al., 2005). Personality and its

pathology are relevant for understanding the problems that people encounter in their relationships with others and self and in the domains of emotions and behavior.

SSRI medication is recommended in the guidelines (Depressio: Käypä hoito suositus, 2020) for depressed adults with comorbid BPD. For adolescents with comorbid depression and BPD, the evidence for the efficacy and safety of psychotropic medication for symptoms of BPD is sparse. If the focus of treatment is primarily on BPD, the guidelines for treating depression might not be appropriate. However, there are studies supporting the use of SSRIs in some PD categories, particiularly to decrease obsessive-compulsive, schizotypal, and paranoid PD symptoms.

Screening of defense mechanisms in adolescents in clinical practice would help to identify ego mechanisms, the early signs of emerging PD, thus averting negative development from adolescence into adulthood. As immature, neurotic, and image-distorting defense styles predict PDs in young adulthood, screening of defense mechanisms in adolescence is important in detecting possible developmental problems that might lead to a more severe personality development and a PD in adulthood.

Treatments should be targeted to the specific needs of the patient. The national treatment guidelines for BPD (Käypä hoito suositus, 2015) recommend that the treatment should primarily be in psychiatric clinics. Results of the present study show that treatment as usual is not sufficiently effective for adolescents with PDs. To affect the course of depression in patients with a comorbid BPD, the patients should receive treatment targeted to their borderline psychopathology because evidence indicates that improvement in BPD often leads to resolution of MDD (Gunderson et al., 2004). If the treatment for depression has limited impact, the diagnostics should be reconsidered.

Evidence shows that at least for BPD mentalization-based (Rossouw & Fonagy, 2012), object relation, and cognitive-based treatments (e.g. Chanen et al., 2008b; Chanen et al., 2009; Mehlum et al., 2014) are superior to treatment as usual among adolescents. DBT includes, for instance, emotional regulation. Adolescents with BPD often have a more impaired capacity to differentiate and integrate the perspective of self with the perspective of others, relative to patients with only MDD. As there are impairments in the theory of mind (mentalization) in adolescents with BPD due to e.g. overinterpretative mental state reasoning (Sharp et al., 2012), treatments focusing on mentalization impairments are of special importance.

Clinical implications can be summarized as follows: Early identification of depression and comorbid clinical symptoms, especially PD symptoms, is essential in impacting the adolescent development into adulthood. PDs should be evaluated when assessing depression among adolescents. Assessments of attachment and social support, defense styles, perhaps also individual defenses, psychiatric clinical disorders, and PD symptoms also under the diagnostic cut-points are important

for focusing the treatment. Evidence-based psychotherapies and, when needed, medication for adolescents with depression should be used. If presenting with a comorbid PD, focusing the treatment also on PDs is needed. Perceived social support is often lower among adolescents with psychiatric symptoms, hindering treatment-seeking and the clinician-patient relationship. Therefore, to help the adolescent and his/her family, it is crucial to make help-seeking as easy as possible. Family support is important in the treatment of adolescents, as the literature has shown that family support has a strong impact, both as a protective factor and as a risk factor, for the adolescent.

7.3 Implications for future research

The results of this study indicate that there is a group of adolescents with a poor distal outcome of depression in adulthood, despite receiving treatment. More detailed research should focus on the predictors of poor outcome as well as on the factors contributing to good outcome in adolescent depression. Further research on the impact of defense styles and separate defenses on clinical outcome from adolescence to adulthood might reveal predictors of deviant personality development and PDs. Also, larger long-term follow-up study samples are needed to gain more detailed information on the separate PD categories, their associations with depression and other psychiatric disorders, and their impact on treatment. As symptoms of many PD categories (schizoid, antisocial, obsessive-compulsive, and dependent) did not significantly change during the one-year follow-up, age-specific psychotherapeutic treatments for specific PDs in adolescence should be a focus of future research. Due to the overrepresentation of girls in naturalistic clinical studies, larger samples are needed to reliably identify gender differences in outcome and in the predictors of outcome of youthful depression. Perceived social support has strong associations with psychopathology, showing that it warrants further study from both protective and risk perspectives.

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